Gas Journal

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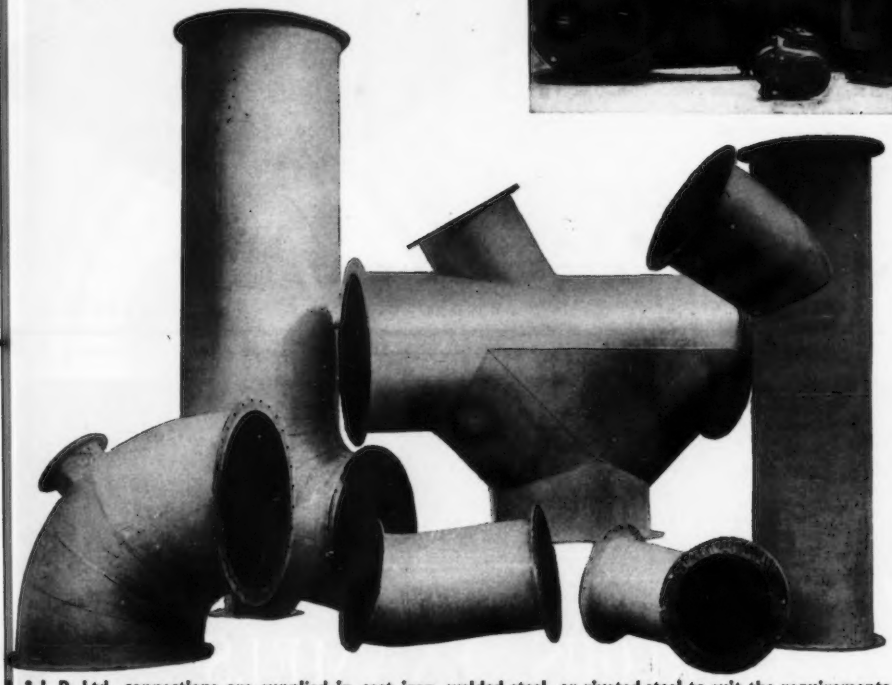

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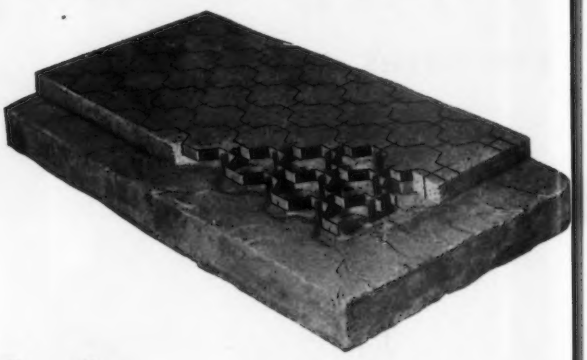

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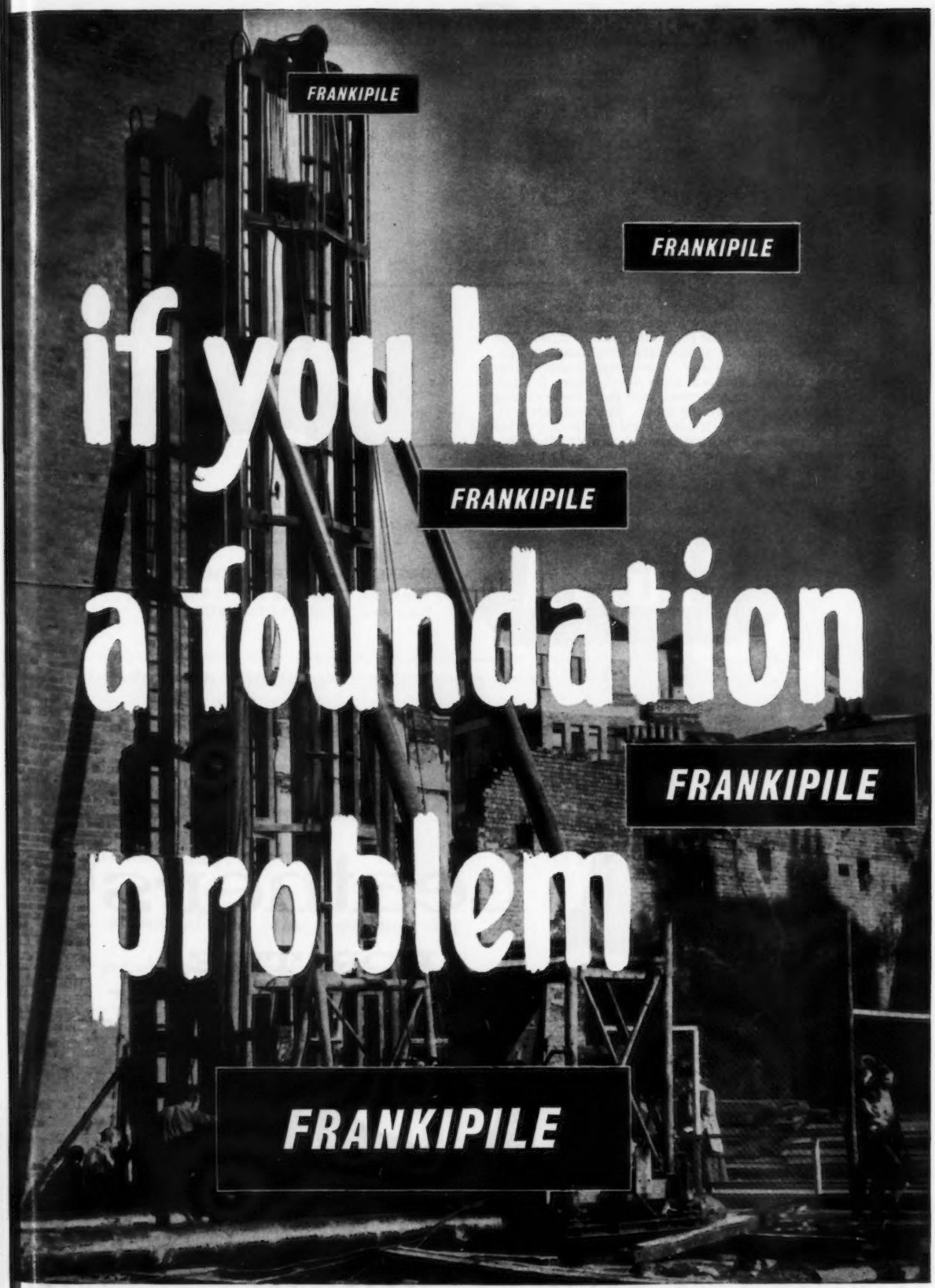

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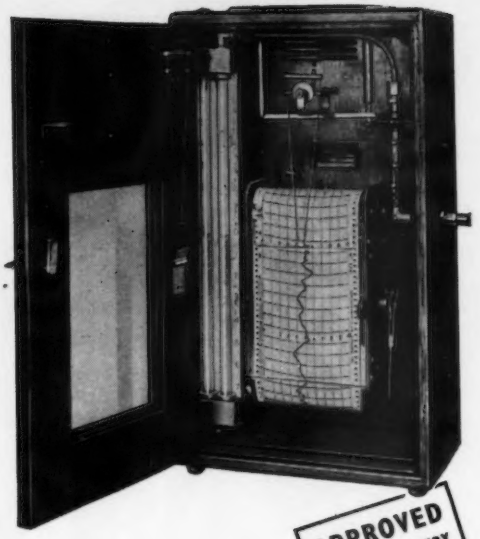

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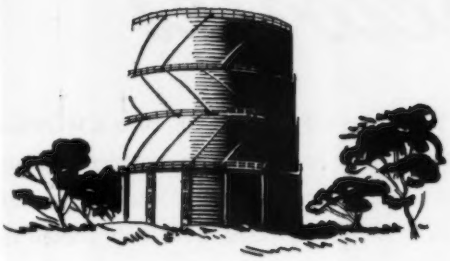

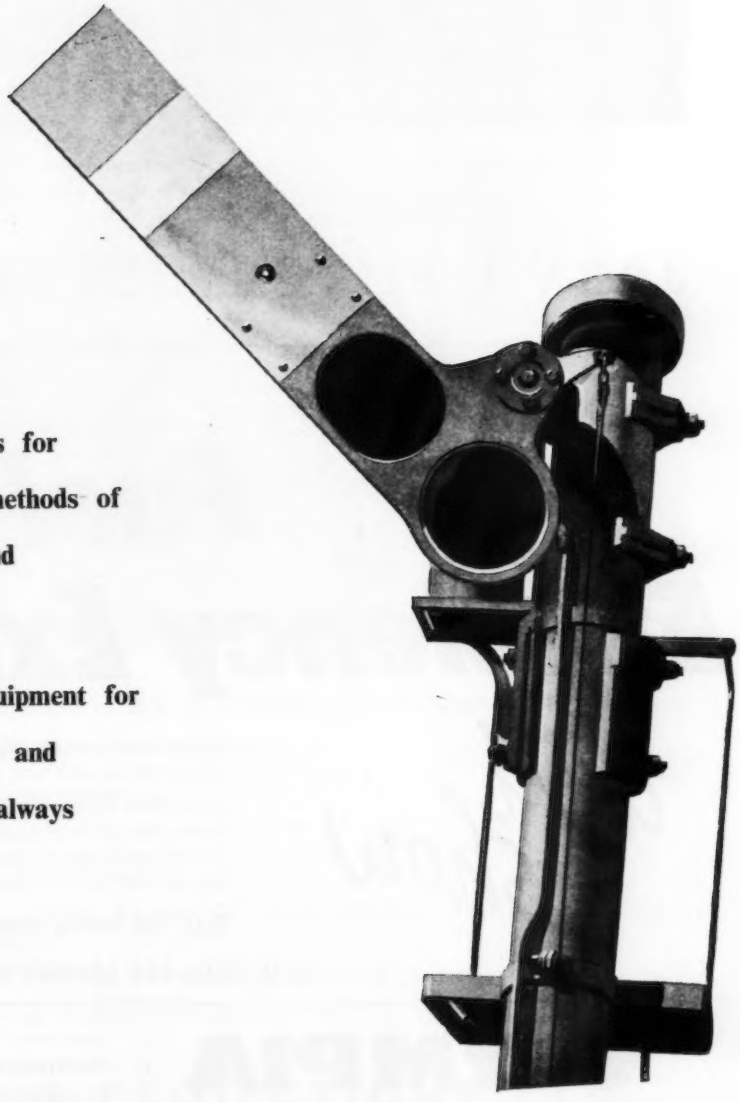

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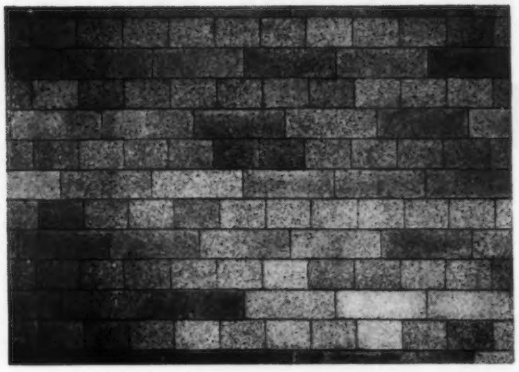

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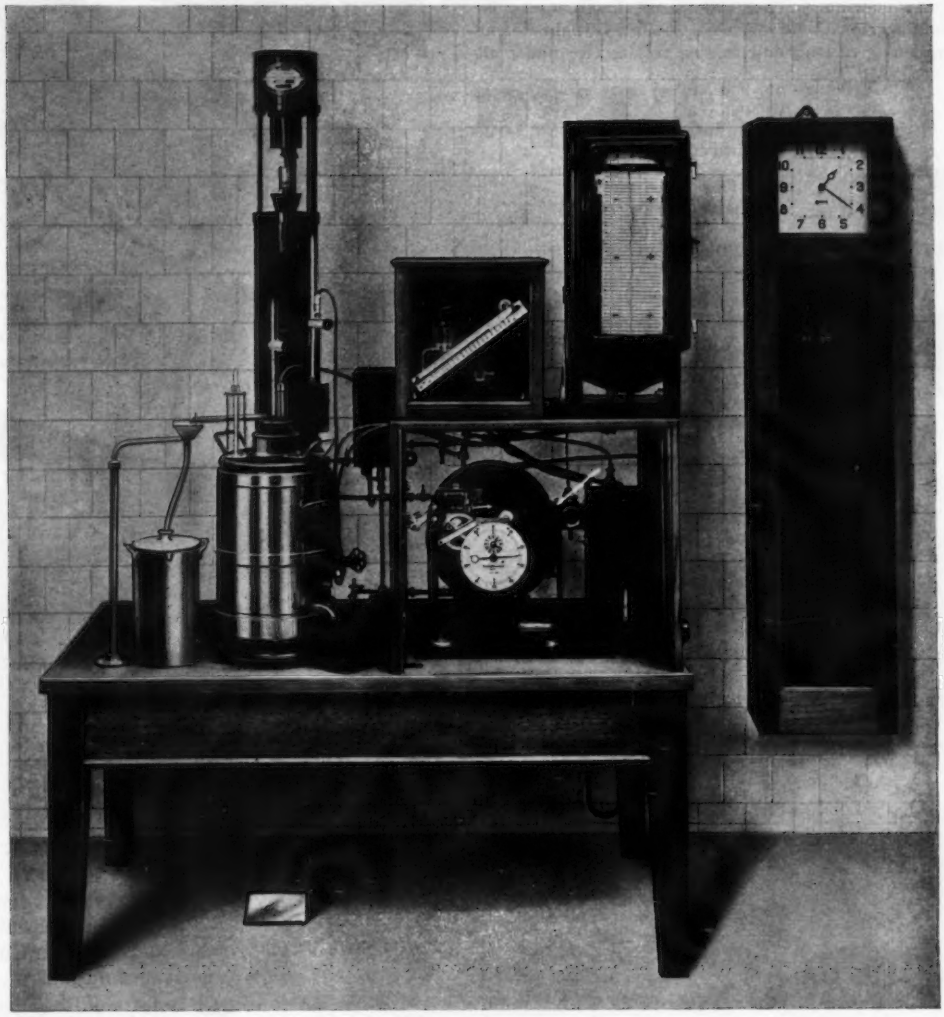

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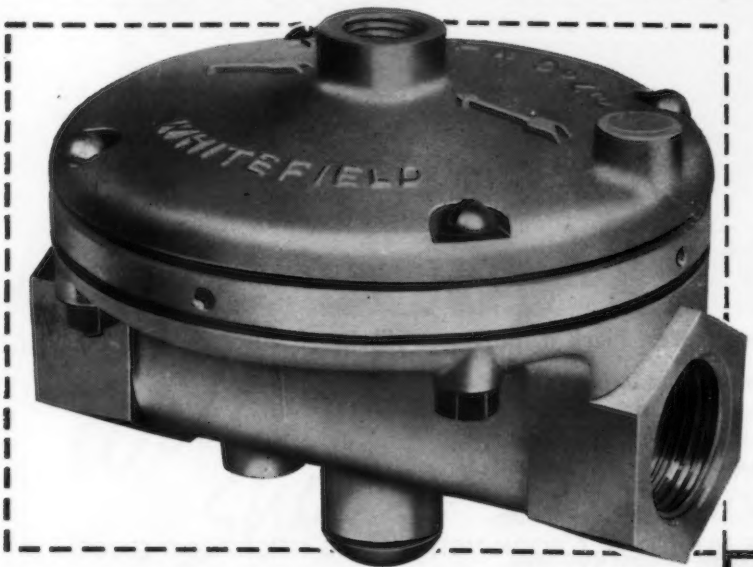

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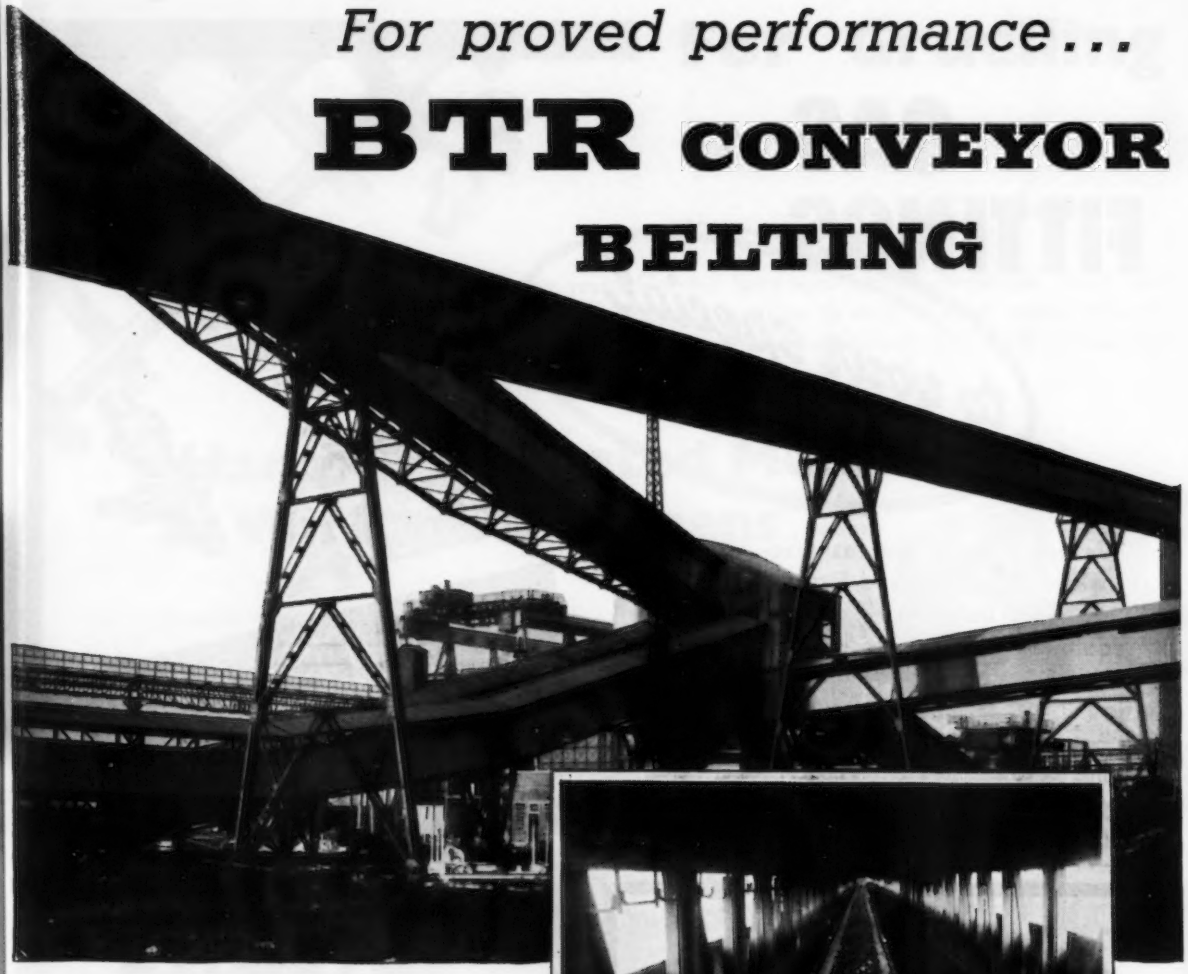

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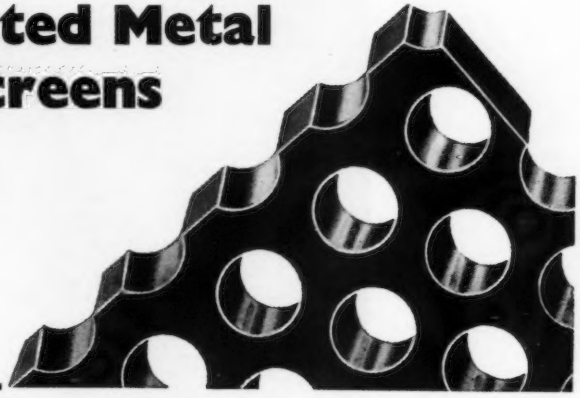

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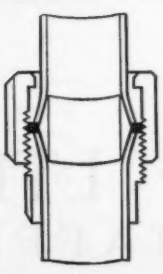

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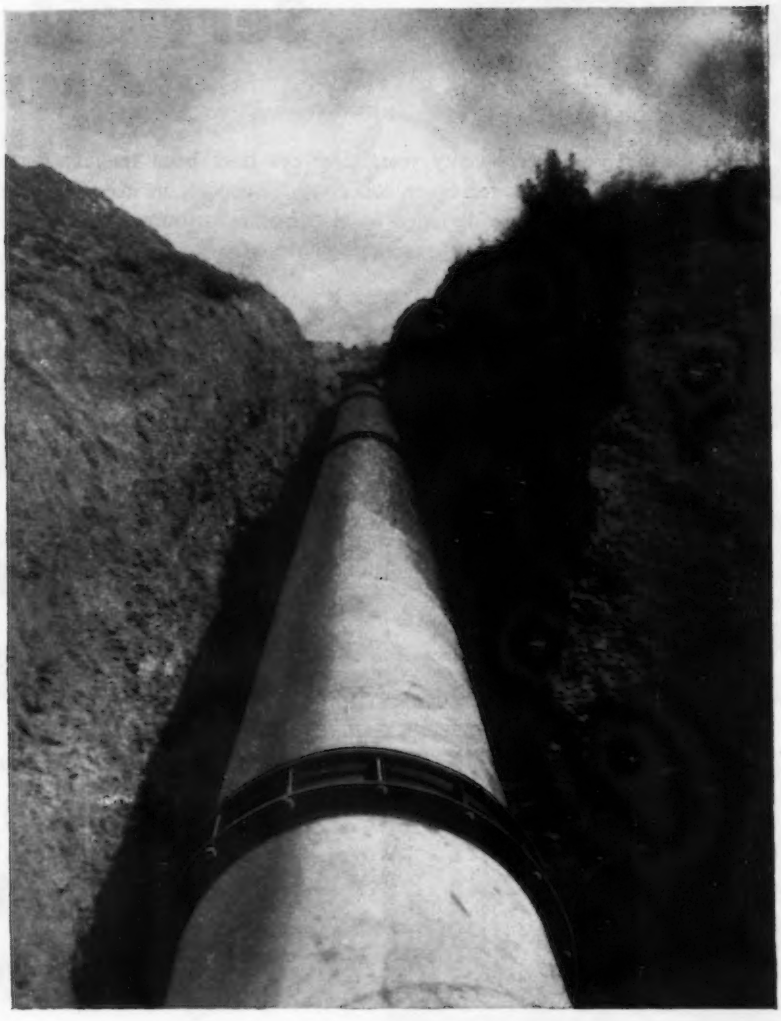

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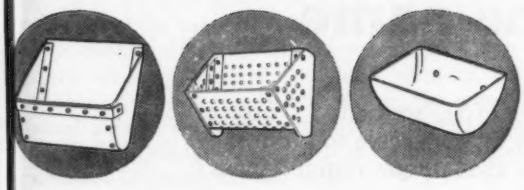

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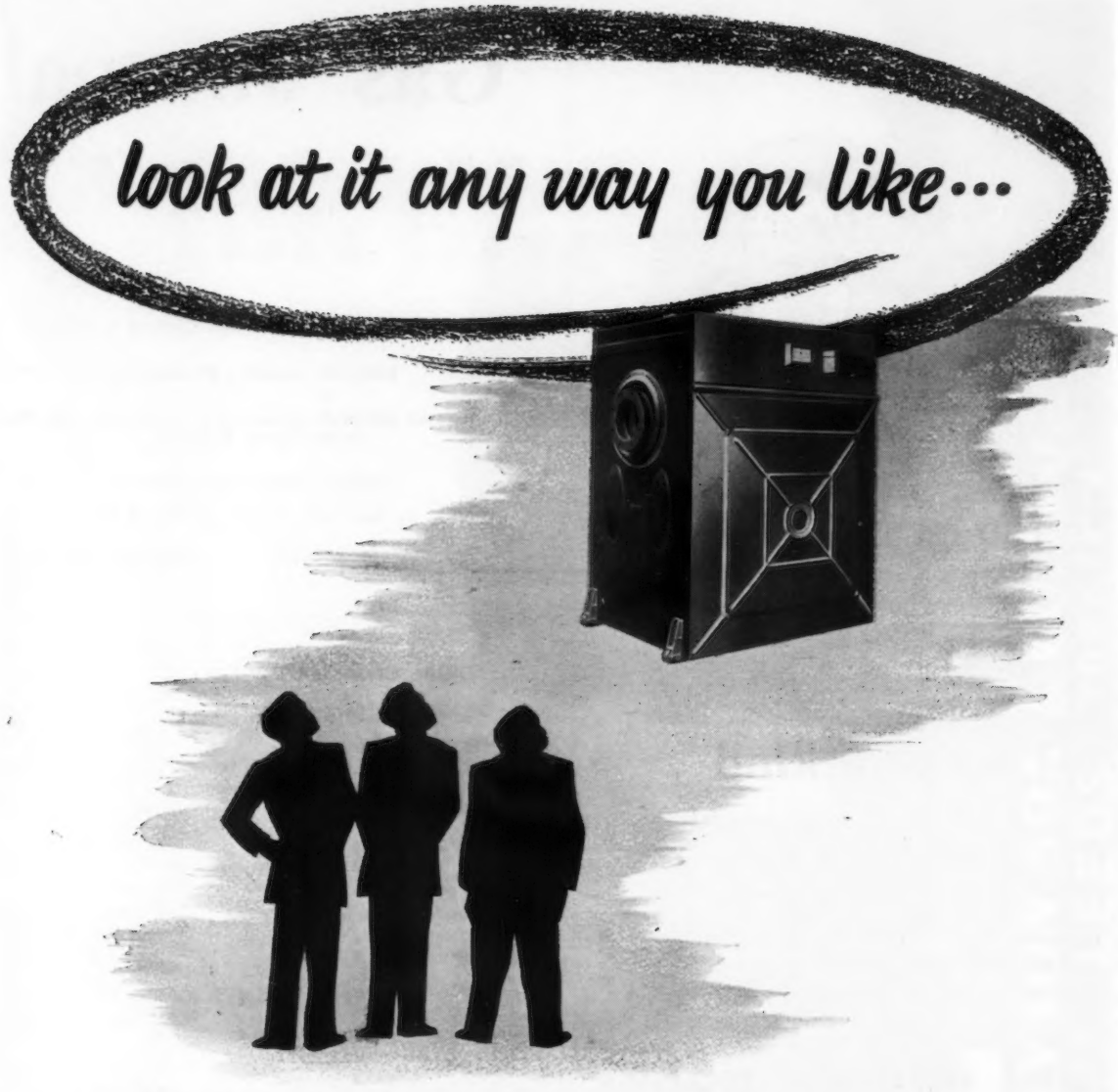

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Gas Journal

VOLUME 287. No. 4859. AUGUST 29, 1956. 108th YEAR

The Gas Industry in Europe

IN this week's issue, we publish an abstract of a report of the United Nations Economic Commission for Europe on 'The Trend of the European Gas Economy,' which stresses the need for the best use of all forms of energy to prevent the effect of an energy famine becoming acute and so making it impossible for the European economy to continue to expand at its present rate. The use of gas for thermal purposes is ideal, but demands for motive power are best met by electricity, and this will, it is hoped, in turn become the responsibility of atomic energy, and release coal and oil for conversion into the most adaptable and easily utilised forms of energy for purely thermal processes.

Gas has all the properties which recommend it for use in industry and for domestic consumption. It is clean, easily controllable, saving in labour, and as it is supplied by a public utility, the pressure and quality are constant, and the supply must be maintained. There is a very distinct difference in the structure of the gas industry on the Continent compared with the United Kingdom. In France and Great Britain the industry is nationalised, in Western Germany it is very largely municipally owned, in Belgium it is largely a matter of concessions to supply certain areas.

In the United Kingdom the area boards are autonomous, manufacture their own gas and distribute it through their own networks, and in very isolated cases may supply another area board if asked to do so; but for raw materials they are dependent on outside sources over which they have very little, if any, control in spite of the gas industry being a public utility and compelled to maintain a supply by Act of Parliament. This situation is accepted and is similar on the Continent, but added to this, the manufacture of the gas may be out of the public utilities' hands.

In many parts of western Europe gas may be bought by the distributors from a gas transporter company who may in turn buy it from the coal carbonising company whose only interest is to get rid of an unwanted by-product from a metallurgical coke works. To a limited extent coke oven gas is purchased in the United Kingdom too, especially in the Wales Gas Board, from the coke ovens in South Wales coalfields, and in the East Midlands Gas Board round Sheffield and Chesterfield, but transporter companies are unknown. The proportion of gas so bought by the gas industry as a whole in Great Britain is small, but all gas sold to the public to whatever type of consumer it may be, must be supplied by the appropriate gas board. In Germany this is not so, with the result that there are two completely different types of consumers, large industrial consumers supplied direct by the producing companies, which may even be their subsidiaries, and the general public, through the public utility networks.

This state of affairs in Germany is largely due to the geographical distribution of industry and therefore the concentration of coking plants in that same area. Since the war matters have improved to the extent that in the Ruhr industrial area a very important gas transporter company has made its appearance in the form of Ruhrgas A.G. which has connected most of the manufacturers' works to feed the long distance transmission mains. This will have had the effect of standardising quality and making the supply more certain in times of peak demand, and at the same time it has improved the load factor at the coke works. This should encourage the expansion of gas consumption by making it available in new districts.

Belgium too is dependent to a great extent on gas manufactured in coke ovens, but in France it is only since 1947 that there has been a big increase in the gas transport grid. This was nearly doubled in length while the distribution system increased by only 2% by the end of 1953. In the last few years both in France and Germany there has been a great development in other methods of gasmaking. The European gas economy therefore is very largely linked to the coke oven located at the steel

works, and the report points out that it is only because it is located there that it pays to manufacture gas by this means, as the costs of gas manufacture will be concealed by some other process at the steel works of which the coke oven plant is part. Coke oven plants built for the express purpose of manufacturing gas are not a paying proposition at all. This, the report shows, is due to the coke/coal price ratio being below the optimum value of 1.4:1 in most European countries except the United Kingdom and Belgium, which is surprising, considering the demand for metallurgical coke throughout Western Europe. In Eastern Europe, however, where the economic policies of the countries concerned are used to influence prices to help certain sections of industry, the state of affairs is rather different. Large volumes of coke oven gas have become available in Czechoslovakia and the price of coke has been adjusted to help the disposal of this gas, and as gas is the most suitable form of fuel, the gas industry has been expanded, but it is doubtful if the further expansion of the industry will be brought about by building more coke ovens. It is hoped to expand the production of natural gas.

It can be seen that conditions are not very favourable for the expansion of the industry on the Continent. The report points out that at present prices there is little incentive for gas to be bought in preference to other fuels, so that although consumption may be high and adequately catered for by the production capacity, the potential demand is by no means satisfied because at an attractive price the many qualities of gas would immediately commend themselves to a very much larger consuming public.

Expansion is not possible as things stand; the iron and steel and the colliery companies are not going to build coke oven plants for the gas industry, and the gas industry is unlikely to want to lose money by building large coke oven plants itself. The report offers the solution that the basis of the Continental gas industry must remain the carbonisation of coal; but by integrating supplies and by the improvement of storage facilities by providing underground storage, the load factor of the coke oven plants, both of those owned by the industry and those outside it, would be increased and the extra gas available during peak periods would go a long way to solving the very rigid and inflexible working of the plants complained of in the report. To help in the expansion of the industry natural gas and all auxilliary means of gasmaking should be employed and also the utilisation of petroleum products and refinery tail gases. The distribution of liquid petroleum products in country districts not served by the utility networks, corresponding to a kind of 'Calor' gas service, has increased enormously, especially in Italy, though in the north of Italy the development of natural gas has been spectacular. Complete gasification of coal should be developed, not only to increase the volume of gas available, but to extend the types of coal available for gasmaking.

The gasification of oil, the cracking of petroleum products, both gaseous and liquid, should be developed, as these processes have most of the advantages of complete gasification of coal, without the need of upgrading the gas, but ultimately, as the report points out, without being able to make assumptions about future costs and availabilities it is almost impossible to forecast what form the industry will take in the future.

In passing it is interesting to glance at a table of statistics in the report setting out the development of the gas industry in various western European countries. England leads in total gas consumption with a figure of 17,244 mill. cu.m., or 339 cu.m. per head of population per year, followed by Western Germany with 12,830 mill. cu.m. or 271 cu.m. per head, with France third at 4,582 mill. cu.m. or 116 cu.m. per head.

Cooking on Council Estates

THE unquestionable pre-eminence in the minds of housewives of gas as a cooking fuel is the chief argument of a convincing booklet by the Gas Council designed to interest local authorities and architects or builders. Apart from the typographical design of the pamphlet, which is well up to the standard of Gas Council advertising generally, the presentation of facts is powerful. 'All over the country, wherever freedom of choice is granted by the authorities, on an average four out of five tenants of the new homes demand gas cookers,' it begins in bold type. And a startling table on the same page shows, for example, that 190,800 solid fuel, and 404,400 electric cookers were built in 1954, against 902,400 gas cookers.

Strong arguments are used to support 'freedom of choice,' including the fact that the Government has declared itself opposed to the complete exclusion of either gas or electricity. In reviewing post-war local authority housing projects the booklet occasionally touches upon other aspects of gas usage, but never allows these to obscure the magnificent record of gas cooking.

The Gas Council's deliberate and pronounced pictorial treatment of what has been happening in local authority estates will probably prove to be most interesting to authorities who receive the booklet. In most instances, they will undoubtedly note, the percentage of tenants choosing gas for cooking has exceeded 90%.

There's Nothing New

'WOOD and paper form a somewhat crude way of lighting a fire—especially when there is gas in the room,' we read in the paper before us. An apt remark now that the Clean Air Bill is almost law and chimneys up and down the country will have to give up smoking. Because wood and paper—and maybe a slosh of paraffin; and perhaps those bits and pieces in the dustpan; and probably sundry other inflammable odds and ends of rubbish—do undoubtedly make quite a lot of smoke. So that, of course a gas poker. . . . But there, who said anything about gas pokers?

No, as it happens, our opening sentence was not written with the Clean Air Bill in mind. The writer had never even heard of the Clean Air Bill. He was not familiar with the term 'gas poker.' Indeed, it's doubtful if he's still alive. For those words are taken from a copy of Cassell's magazine dated 1881!

The subject of the article was, indeed, a 'little device' for lighting fires that so resembled the gas poker of today as to make no odds (the flames came out at the end instead of along the sides, that's about the only technical difference). Moreover, at the time at which the article was written the invention was already a year old, and it was a new and improved model Mark II that was being described!

And it could do a great deal that its present-day counterpart couldn't dream of doing. Nonsense? Wait till we tell you: '. . . With this recent addition the contrivance will light 20 fires with a consumption of one pennyworth of gas.' Find us the gas poker that can do that today and we'll eat our editorial hat.

Courtesy: W. C. HOLMES & CO., LTD.

Photograph: STEVE TENNANT, Walter King Photos.

SKY-LINE

An afternoon sky is the back-cloth for this dramatic picture of the W. C. Holmes benzole scrubber at the new Rotherham works of the East Midlands Gas Board, of which the Woodall-Duckham Construction Co., Ltd., are the main contractors.

Personal

DR. H. W. MELVILLE will take up his appointment as Secretary of the Department of Scientific and Industrial Research on August 27. DR. G. B. B. M. SUTHERLAND will take up his appointment at Director of the National Physical Laboratory on September 14.

MR. CLIFFORD AVEYARD, Manager of the Malton undertaking, Yorkshire, has received a Royal Humane Society testimonial from Lord Middleton, Lord Lieutenant of the East Riding of Yorkshire, for his brave but vain attempt to save a man from the icy River Derwent in January.

MR. J. R. WINGFIELD has been appointed a Director of Huntington, Heberlein & Co., Ltd. (subsidiary of Simon-Carves Ltd.). He retains his position as Company Secretary.

COLONEL R. T. EDWARDS, formerly Managing Director of the Birtley Co., Ltd., remains as Manager of the factory but also becomes a member of the Board of Directors of Caterpillar Tractor Co., Ltd., who have acquired the factory. Colonel Edwards, who is 58, was born and educated in Essex. He was in the Royal Artillery in the first world war before becoming a pilot in the Royal Flying Corps during which he was awarded the Air Force Cross. Between wars Colonel Edwards worked for Metropolitan-Vickers on turbine design and engineering before moving to Newcastle as sales representative for that company. In the last war he served in France until Dunkirk, and in 1941 became Tank Production Officer for the Ministry of Supply before joining the Birtley Co., Ltd., in 1944.

MR. M. ALLON, of Washington Station, Co. Durham, has been reappointed part-time member of the Northern Gas Board.

Diary

September 4.—EAST MIDLANDS G.C.C. Nottingham Chamber of Commerce, Smithy Row, Nottingham. 11.30 a.m.

September 4.—SOUTH EASTERN G.C.C. Caxton Hall, Westminster, S. W. 1. 11 a.m.

September 5.—SOUTH WESTERN G.C.C. 34, Bridge Street, Taunton. 11 a.m.

September 10.—NORTHERN G.C.C., 3 Grainger Street, Newcastle upon Tyne. 11.15 a.m.

September 19.—SCOTTISH ASSOCIATION OF GAS MANAGERS: Golf Circle A.G.M., Curling Hall Hotel, Largs. 5.30 for 5.45 p.m.

September 21.—MANCHESTER AND DISTRICT SECTION, I.G.E.: Visit to the Works of W. J. Jenkins & Co. Ltd., Retford, Notts.

September 22.—EASTERN JUNIOR GAS ASSOCIATION: Presidential Meeting, George Hotel, Colchester, 11 a.m.

September 24.—WEST MIDLANDS G.C.C. Committee Room 'C', City of Birmingham Education Department, Council House, Margaret Street, Birmingham 3. 2.30 p.m.

September 26.—NORTH WESTERN FUEL LUNCHEON CLUB: Opening session.

October 2.—SOUTH EASTERN G.C.C. 11 a.m.

October 3.—INCORPORATED PLANT ENGINEERS: Polygon Hotel, Southampton. 7.30 p.m.

October 4.—WALES AND MONMOUTHSHIRE SECTION, I.G.E.: 10.30 a.m.

MR. THERM GOES COUNTY

At the British Food Fair, Olympia

WITH the weather we have learnt to expect this summer, the spectacle of a vast cascade of water dominating all he surveys might damp the enthusiasm of the visitor to the British Food Fair which opened at London's Olympia yesterday. But the visitor's enthusiasm would very quickly be revived by this fascinating show, and in particular by the excellent Gas Council contribution which is the largest exhibit at the Fair.

The Ideal Homes Exhibition apart, the Food Fair is probably the most important event of this nature in the Gas Council calendar, and they have certainly made the most of it. Their display might reasonably be described as a gas salesman's paradise and will undoubtedly benefit the industry very substantially.

Local Dishes

Each of the 12 boards is represented by a kitchen containing a gas cooker, water heater, and refrigerator. To those who saw these kitchens as they neared completion there might have appeared to be a sameness about them. But the moment the lights went on and the cooks went into action the different characteristics of the various parts of the country the boards represent became apparent. 'Mr. Therm Goes County' is the Gas Council catch phrase at the Fair and the delectable and distinctive local dishes which the 80 home service advisers prepare in the 12 kitchens certainly bear the catch phrase out. This year the exponents of the culinary arts are not dressed in their usual white caps and gowns but in attractive summer dresses which give the kitchens a delightfully informal, homely appearance.

Special mention must be made of the Northern Gas Board kitchen which is unique in having a man included on the strength of its staff. And just to highlight the international nature of the gas industry, it must be recorded that one of the demonstrators hails from Johannesburg but feels entirely at home in the South Western Gas Board kitchen since the Renown VI cooker with which it is equipped is the same as the one in her own home in South Africa.

Of the equipment special mention should, perhaps, be made of the Main Adonis water heater, and the Easiclene Mark II refrigerator which are newcomers to the gas appliance market.

Having watched this wide range of gas appliances in operation in the various kitchens, the interested visitor may go round 'to the other side' of the Gas Council stand and take a closer look at them and, indeed, have a full demonstration, for all appliances on show are live and the public can really see for themselves just what they are like and what they can do.

And our forecast is that this well devised show will do much to mitigate against the decline in sales caused by the credit squeeze.

APPLIANCES ON VIEW

The equipment with which the various kitchens are fitted is as follows:—

South Western Gas Board.—Parkinson Renown VI cooker, Radiation S.12/2 water heater, Electrolux L.230 refrigerator, and Nevastane kitchen cabinets; Southern—Main Century cooker, Main Thermain 2 water heater, Main M.32 refrigerator, and W. H. Paul kitchen cabinets; North Thames—Flavel Envoy cooker, Flavel National 20 water heater, Astral B/P-B refrigerator, and Nevastane kitchen cabinets; South Eastern—Radiation 84G cooker, Radiation S.3 Speedlyn water heater, Main M.32 refrigerator, and Leisure kitchen cabinets; Eastern—Cannon A.130 cooker, Ascot 509 boiling water heater, Electrolux L.230 refrigerator, and C.S.A. kitchen cabinets; West Midlands—Parkinson Renown VI cooker, Ewart 75 water heater, Easiclene Mark II refrigerator, and W. H. Paul kitchen cabinets; East Midlands—Radiation 76 cooker, Radiation S.3 Speedlyn water heater, Electrolux L.23 refrigerator, and Nevastane kitchen cabinets; North Eastern—De La Rue Warwick cooker, Ascot 503/2 water heater, Astral BM/B refrigerator, and Leisure kitchen cabinets; Northern — Main Century cooker, Main Adonis water heater, Main M.32 refrigerator, and C.S.A. kitchen cabinets; Scottish—General Gas Crusader cooker, Ewart S.18 water heater, Astral B/P-B refrigerator, and Leisure kitchen cabinets; Wales—Flavel Envoy cooker, Flavel National 20 water heater, Electrolux L.500 refrigerator, and W. H. Paul kitchen cabinets; North Western—Stove X2 cooker, Ascot 503/2 water heater, Easiclene Mark II refrigerator, and Nevastane kitchen cabinets.

Miners Prefer Smoke

COAL CHEAPER THAN 'CHAR'

AN odd aspect of the smokeless zone has turned up at Motherwell and Wishaw Town Council's newest housing area, Coltness Estate, where some tenants are complaining because they are not allowed to use coal on their fires.

The dissidents are miners. One of them said: 'We get our coal for 23s. 6d. a ton, but now we must pay over 7s. a bag for char.' Miners have asked their union representatives to look into this matter, and there is talk about a petition being organised to ask the Council to change their minds about making Coltness a smokeless zone.

Against that there is the widely-held view that a few people should not be allowed to spoil things for others. Said a resident: 'It's simply wonderful living here away from all the smoke and dirt.'

There is general agreement that the smokeless fires ensure abundant supplies of really hot water.

Favourable Comment

The smokeless zone has brought favourable comments from many authorities, including representatives of the Ministry of Fuel and Power who carried out an inspection recently.

'The step taken by the town,' said a Council housing official, 'is one which anticipated the provision of the Clean Air Act, and while other authorities have been considering setting up similar zones, Coltness is the first one in this part of the country.'

When the scheme is completed, within two years, there will be 1,100 houses in Coltness.

YE OLDE BRITISH GAS LAMP FOR BERLIN SHOW

AN ornamental gas street lamp fitted with an electric bulb will light the approach to a full size reconstruction of a 17th-century English inn to be featured in the British pavilion at the German Industries Exhibition in Berlin during September. The street lamp will be the 'Windsor' manufactured by William Sugg & Co. Ltd.

The Windsor was first manufactured in 1912 and Suggs produced a new version in 1920. Many thousands of these lamps are still in use throughout the U.K.

Although Suggs now specialise in the design and manufacture of gas heating appliances, they still provide street lamps when required and are one of the main suppliers of gas lighting to British Railways.

Sugg gas street lamps—many of them now converted to electricity—can still be seen in the courtyards of Buckingham Palace, St. James's Palace and Windsor Castle, at the Horse Guards, and in Trafalgar Square, Parliament Square and Hyde Park.

NEWS IN BRIEF

THE SOCIETY for Analytical Chemistry holds a Congress at St. Andrews University from June 24-28, 1957. Developments in chemical analysis will be discussed and the possible directions of new advances will be reviewed. There will be an exhibition of some of the newer types of apparatus.

At the A.G.M. of the angling section of the North Thames Gas Sports Association recently, trophies were presented to prizewinners by Mr. Brian Wood, Chairman of the Association, and Secretary of North Thames Gas Board.

The Building Plant Exhibition (September 12-19) at Gosforth Park, Newcastle, will devote 75,000 sq. ft. of space to demonstrations by bulldozers, excavators, and other heavy machines.

Dealers Fined for Selling Exposed Fires

THE first cases in Bradford of contravention of the 1952 Act, which requires all gas and electric fires exposed for sale to be fitted with guards, came before the Bradford Magistrates recently. Two secondhand dealers, said to have exposed for sale in one case an old gas fire and another an old electric fire without guards fitted, pleaded that they did not know the Act applied to secondhand articles.

'Ignorance No Excuse'

The Chairman of the Bench, Mr. G. Holdsworth, told them that ignorance of the law was no excuse. When one of the dealers said that many old radiators without guards were being sold every day of the week by auction and in other secondhand shops the Chairman said that did not excuse him from contravening the Act.

Fines of £5 in each of three cases were imposed.

Now, in the Good Old Days . . .

Thirty-two employees of the North Thames Gas Board, each with 40 years' service, were given long service awards by the Board's Chairman, Mr. Michael Milne-Watson, recently. Five members of the former rental department, which was decentralised, are seen talking over old times. They are (left to right), Mr. G. Blow (Walham Green), Mr. W. Brown (North Western Division), Mr. A. Burfitt (Central Division), Mr. S. Major (North Western Division) and Mr. L. Tizzard (Central Division).

BRITISH ENGINEERS ARE AWARDED PAKISTANI CONTRACT

Spencer & Partners, Consulting Engineers, 19, Grosvenor Place, London, S.W.1, who designed and supervised the cathodic protection system for the Sui-Karachi gas pipeline in Pakistan on behalf of the Sui Gas Transmission Co. Ltd., have been commissioned to design and supervise similar installations for the proposed Sui-Multan gas pipeline of the Pakistan Industrial Development Corporation and also carry out coating inspection of the new pipeline during its construction.

Left to right: Mr. L. Boden, Mr. H. Cramphorn, Mr. H. Rothwell, and Mr. A. Longden, N.W.G.B., Sales and Service; with Mr. B. Burgess, of Electrolux, Ltd.

REFRIGERATOR SALESMEN BEAT CREDIT SQUEEZE AND WEATHER

Contest Time Halved—Sales 50% Up

NO one would expect much luck selling gas refrigerators in a snow storm. Or during this year's summer, for that matter—especially with the credit squeeze on. Which only goes to show how very wrong one can be.

For in this year's refrigerator sales competition organised and sponsored by Electrolux, Ltd., salesmen of the North West Gas Board beat last year's figures by 50% in half the time. The contest lasted four weeks instead of eight (and those four weeks were mid-June to mid-July when all the cloudbursts and arctic gales were flying about!)

In Snow Storm!

And that bit about selling refrigerators in a snow storm? That was Mr. H. H. Havican, N.W.G.B. outside representative in Rochdale, one of the winners in the competition. One day last winter Mr. Havican said he would sell a refrigerator in a snow storm just to prove to himself that he could. He did. But he thought it might be a fluke and he tried again in another snow storm. He sold another. But he thought that might be a fluke, too, so he tried again just after a snow storm. And sold a third.

He sold a dozen in the Electrolux competition. Good going. But Mr. W. Graham, outside representative, Manchester Group, beat him by four, having hardly given a thought to selling refrigerators before. And Mr. E. Wallis, West Lancs. Group, Blackpool, sold 24.

Mr. Wallis decided to exploit the Clean Food Act, and launched his attack on boarding houses. He sold 19 in a road 500 yds. long. He started off by reconnoitring the back yard. If the morning's milk bottles were still outside he reckoned there was no 'frig.' inside and in he went.

To mark their achievements the successful N.W.G.B. contestants were entertained by Electrolux, Ltd., last week, travelling down by coach, spending the night in Luton, and next day visiting the Electrolux factory, and later Luton Hoo, home of Sir Harold Wernher, Chairman of the Company.

Chief organisers of the competition were Mr. C. H. Bramall, Electrolux North West Area Manager, and Mr. J. Rogers, N.W.G.B. Sales and Service Officer.

It has been found that to stimulate sales a competition beats cash and other inducements every time. As Mr. M. A. Craig, Electrolux Refrigerator Sales Manager, said at the luncheon which followed the visit to the factory, this is something which the gas industry might well remember—and sponsor a few competitions on its own account.

Gas Council Films

A NEW catalogue listing and describing the Gas Council's extensive film library is now being circulated. Among the recent additions to the catalogue is a series entitled 'The Story of Gas,' comprising 14 films with complementary film strips, teaching notes and wall charts.

These films are said to represent the most complete analysis of any single industry ever made, covering all the processes of manufacture from the solid fuel to the distribution and use of the purified gas and by-products by the consumer.

Gas Council films now reach an audience of 8 mill. a year, distributing to schools, churches, film societies, local authorities, and other organisations.

How Much Gas Should a Gasworks Use . . .?

LURGAN Borough Council have decided to ask the gasworks manager to explain a consumption of 173,600 cu.ft. of gas in the local gasworks during the month of July.

When the minutes of the Gasworks Committee were presented at a meeting of the Council, Councillor Rogers expressed the opinion that the amount of gas used in the works during July was excessive, and the Mayor (Alderman F. A. Monroe) agreed that it did seem a very big amount.

Explaining why the figure looked so big the Town Clerk (Mr. W. Best) said July had been a 'five-week' month.

Councillor Rogers: I have been watching these figures in recent reports and they've been very high all along. It's not only for July.

Higher Fees for Welding Course

BRITISH OXYGEN GASES LTD are to charge more for their oxy-acetylene welding courses. The two-week courses will cost £10 instead of £7 starting from September 1.

The Company has run these courses since 1935, always at a considerable loss. And the higher fee—to meet increases in the cost of materials used—will still fail to cover the expense of each student's training.

The courses, mainly for the benefit of customers' operators, are attended by nearly 1,500 students annually including some from overseas.

British Oxygen welding schools are at Cricklewood, Glasgow, Chester-le-Street, Manchester, Leeds, Birmingham, Cardiff and Bristol.

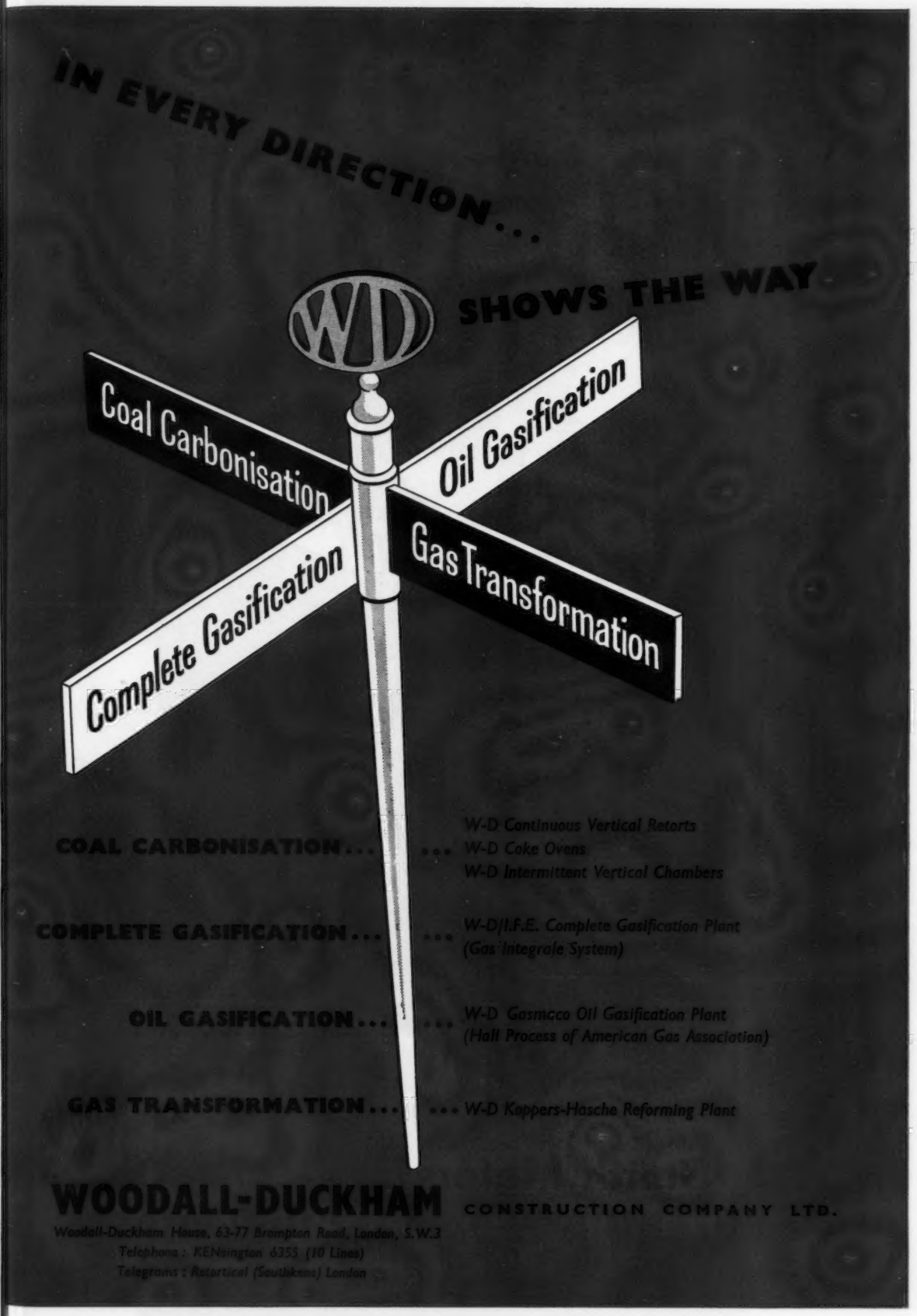
The fee for the oxy-acetylene cutting course remains unchanged at 15s. a day, and for the 'Argonarc' welding course, £11 5s.

POWELL DUFFRYN RESULTS

Powell Duffryn Ltd. announce that the consolidated trading profits and other income for the year ended March 31, 1956, after deductions, amount to £2,316,118 (previous year £2,009,747 to which was added transfer from taxation reserves £25,000). Taxation is £1,245,886 (£1,192,936), leaving consolidated net profit at £1,070,232 (£841,811).

The directors recommend a final dividend of 10%, less tax, on the ordinary shares, making with the interim 16% for the year.

The amount at the credit of the consolidated profit and loss appropriation account to be carried forward to 1956-57 is £2,193,320 (£1,915,488).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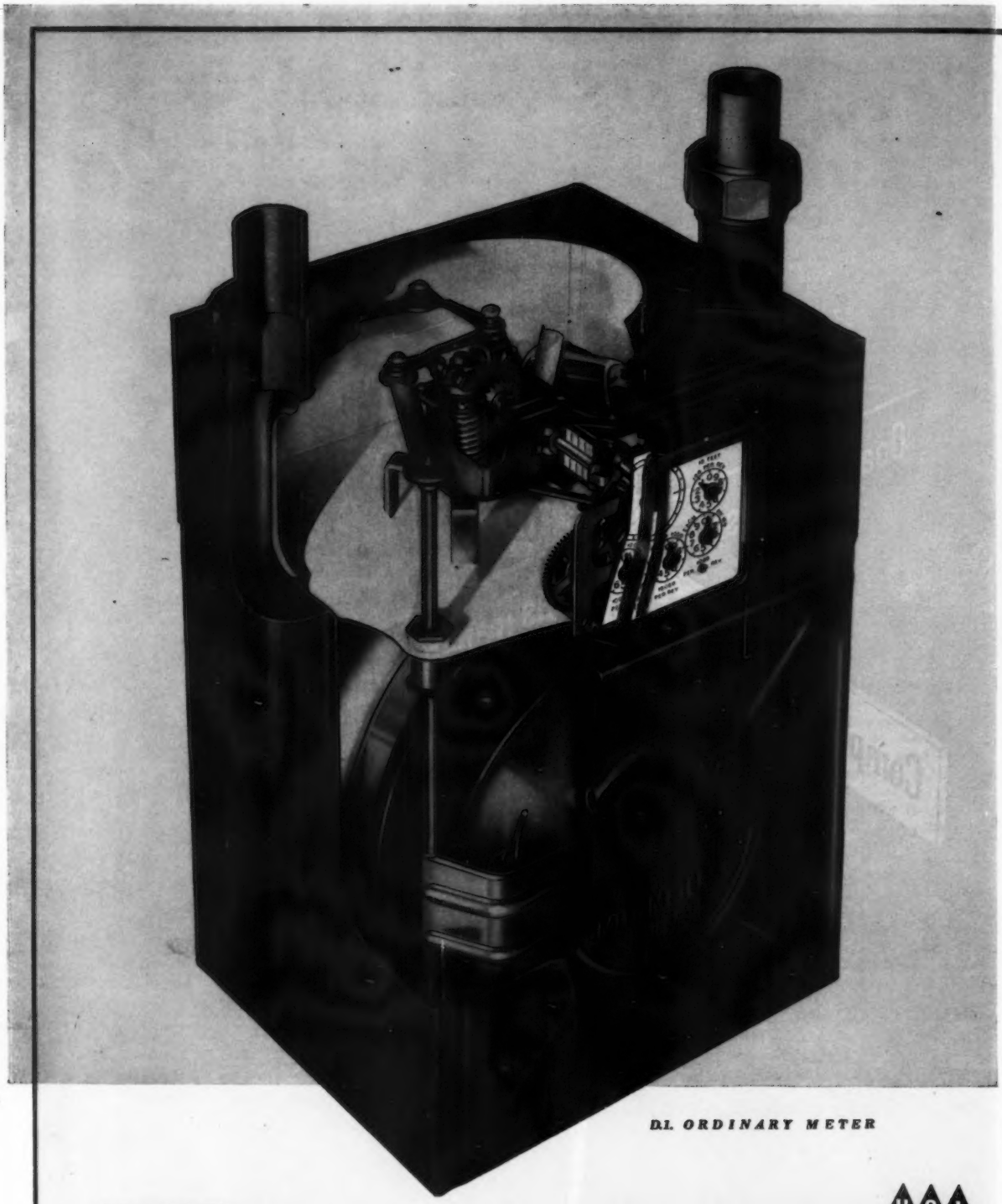
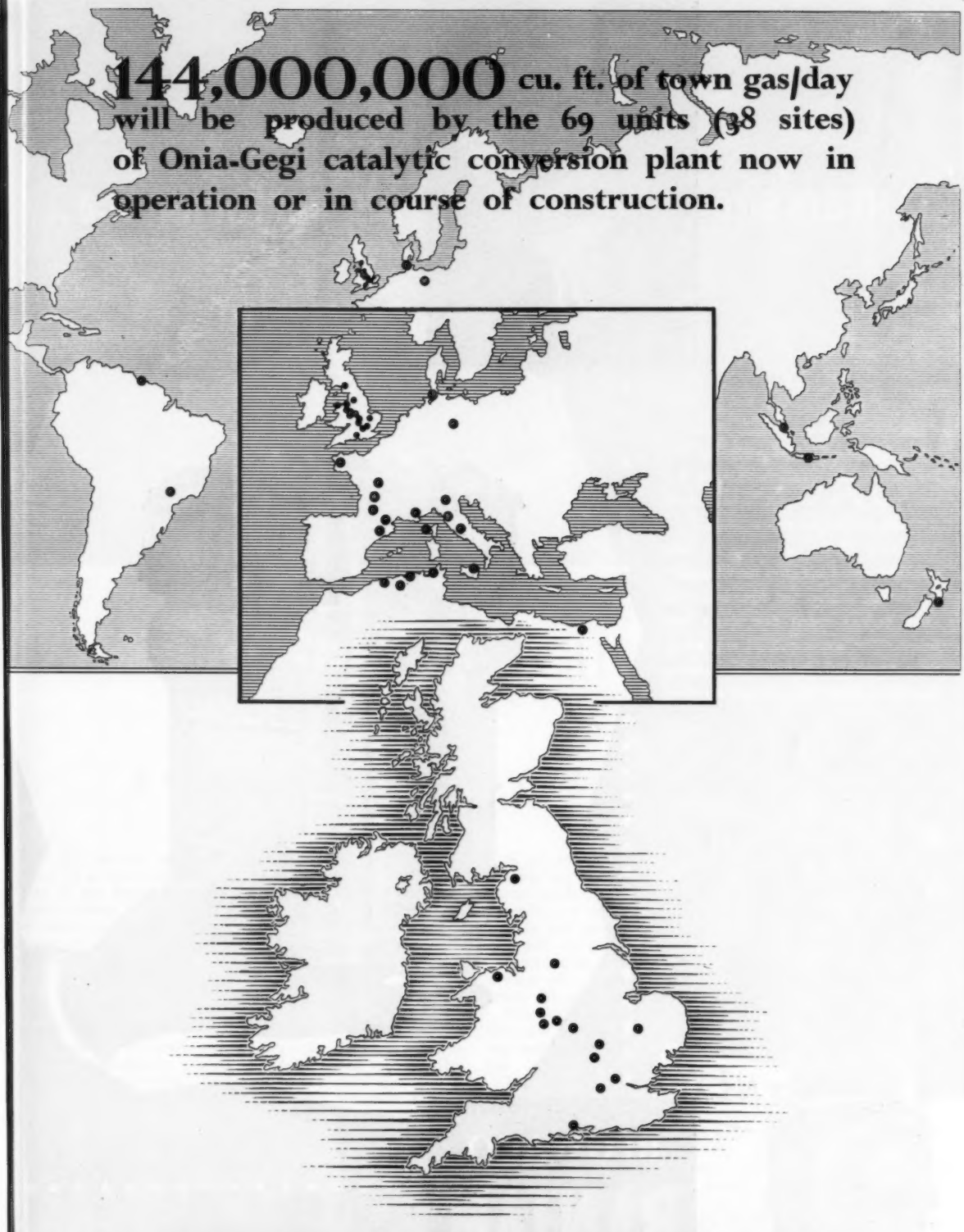


D.I. ORDINARY METER

UGI GROUP

Smith Meters *Limited, 186 Kennington Park Road, London, S.E.11*

144,000,000 cu. ft. of town gas/day will be produced by the 69 units (38 sites) of Onia-Gegi catalytic conversion plant now in operation or in course of construction.



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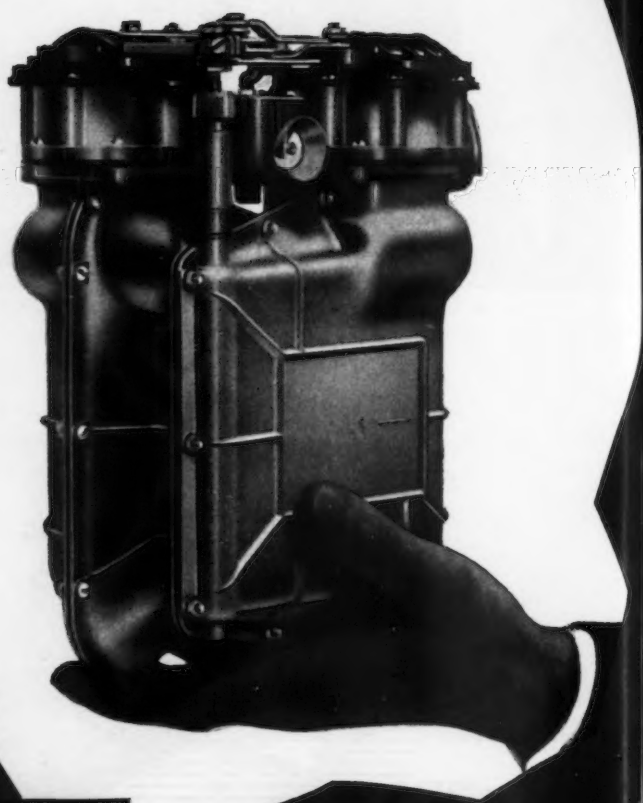


NEW

BEGWACO

DIAPHRAGM GAS METER

Installation at an N.C.B. coking plant.

THE FLAMRICH (PSH) RESONANCE SCREEN

A Versatile Tool for the Carbonising Industry

THE modern resonance screen makes use of the kinetic energy of a vibrating mass. In its basic form the vibrating frame of the screen is a mass oscillating between two compression springs which alternately store and return this energy. The following paragraphs are based upon the very clear account of this principle in Duncan and Starling's *Text Book of Physics.*

General Principles

It is frequently possible to set a body of great inertia in vibration by means of a very small force, provided that this force is applied at regular suitable intervals. Thus, if a heavy body be suspended by a wire, it can be set in vibration by pulling a fine silk cord attached to it, provided the cord is pulled intermittently and at such times that the pulls help to increase the velocity of the body. In this way a vibration of large amplitude may be set up, although the cord may be so thin that it would break rather than pull the body steadily through any considerable fraction of the resulting amplitude. The setting up of the vibration depends upon the timing of the impulses. When the applied force has a frequency equal to the natural frequency of the suspended mass, the phenomenon has been called 'resonance.'

The amplitude of such a forced vibration may be calculated in terms of that of applied force, and of the two frequencies concerned. The result may be represented conveniently in the form of a graph shown in Fig. 1. On this graph OX represents the ratio of the frequency of the applied force to that of the natural frequency of the body to which it is applied. The ordinate represents the ratio of the amplitude of the forced vibration to that of the applied force.

It will be seen that if OX = 1 the ordinate is infinite. In practice an infinite amplitude is never attained, owing to the damping effect of friction. Nevertheless, the graph does show the effect of resonance, which is well known to occur during starting and stopping of conventional vibrating screens which normally operate at well over twice their natural frequency.

Figure 2 shows the design of a PSH resonance screen. It consists of a vibrating screen frame (a), a balancing or base frame (b) and a drive (e).

The vibrating frame (a) is supported on laths (c), and its vibration is limited at either end of its movement by the working buffers (d) which are mounted on the balancing frame (b).

The balancing frame (b) is three to five times the weight of the vibrating frame (a) and therefore swings at only one-third to one-fifth of the vibrating frame's amplitude. It is supported on rubber columns (g) with no metal connection to its supporting structure (see also Fig. 3).

The resonance screen operates at or near its own natural or resonant frequency, the energy of its movement being stored at the end of each stroke in rubber buffers (d) which are distributed along the length of the screen. On the return movement these buffers release the energy stored and as a result the only power required is that necessary to make up frictional loss, and supply the current for the actual conveying of the material (Fig. 4).

A further result of operating at or near natural frequency is the smooth and regular starting and stopping of even the largest screens.

The drive consists of an eccentric (e) with a soft rubber buffer (f) interposed between connecting rod and vibrating

screen frame (a). This elastic connection permits the use of a very small drive assembly and by spreading the starting load over a number of revolutions further reduces the size of motor necessary (Fig. 5).

From the diagrammatic drawing, Fig. 6, it will be understood that the inclusion of the soft rubber buffer (f) permits the adjustment over a wide range of the amplitude of the system with a standard eccentric.

Control and variation of the desired amplitude of the vibrating screen frame is effected by simple adjustment of the air gaps between the rubber buffers (Fig. 7).

Because of the simple adjustment of the amplitude, it is generally considered good practice to start a new screen with a comparatively small amplitude and then under actual working conditions adjust it to the minimum practical requirement so as to ensure the gentlest possible handling of the material to be screened and to obtain longest life of screen surface and screen cross members. This is particularly important in cases like the sizing of large coal or coke and in dewatering on wedge wire and similar surfaces where replacements are more usually necessary because of fatigue in the cross rods of the wedge wire rather than wear on the wedge sections.

The introduction of air gaps represents the most important departure from the original pure resonance screen and explains the independence of the modern resonance screen from all except the most severe variations of feed.

In the case of exceptionally severe operating conditions, such as met with underneath wagon tipplers or when scalping argillaceous ore, the fixed drive ultra-resonance screen fitted with a more powerful motor will ensure reliable operation independent of all load variations (Fig. 8).

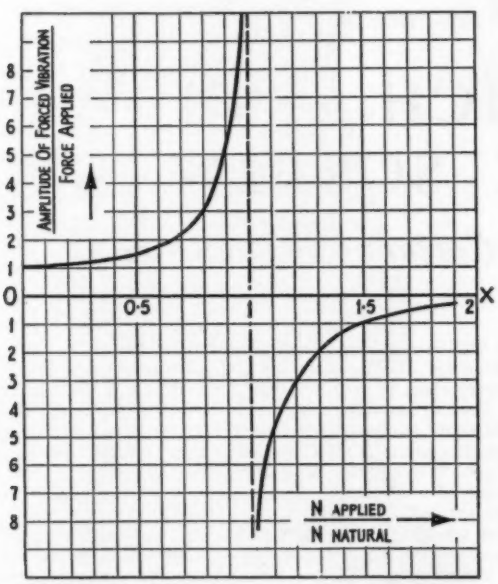


Fig. 1. Graph showing amplitude of forced vibration.

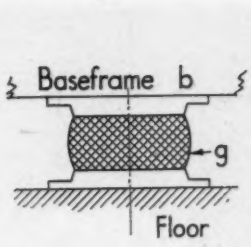


Fig. 3. Rubber shock absorbers.

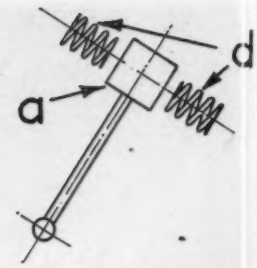


Fig. 4. Vibrating frame and working buffers (diagrammatic).

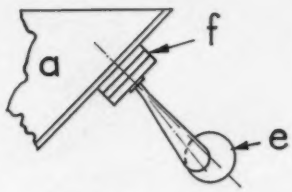


Fig. 5. Drive.

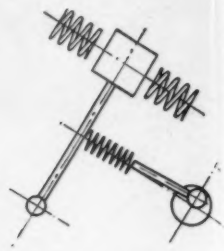


Fig. 6. Effect of elastic drive.

Vibration to the supporting structure is eliminated by placing the whole self-contained system on rubber shock absorbers (g) as shown in Figures 3 and 9.

The drive and the driving motor may be fitted at either end or even in the centre to suit the layout of the plant, both being mounted on the base frame and requiring no separate supports.

Application of Screen

The choice of a correct screen is far from an exact science and all the rules used only attempt to take account of experience of similar applications. Here we have a screen with an amplitude which can quite easily be adjusted on site to suit conditions. It is normal to ensure that each machine will run only a little above the minimum intensity found necessary to satisfy operating requirements. Such care will be inevitably reflected in low maintenance cost.

While on the subject of intensity a brief summary of the factors involved might not be out of place. Variables in screening are the following:

Name	Symbol	Unit
Speed of operation ...	n	rpm
Slope	β	°
Angle of vibration ...	α	°
Ampliture (stroke/2) ...	a	mm or in.
Type of vibration ...	circular, elliptical, straight line.	

One indication of the intensity of stresses in a given screen is obtained from the application of the following formula:

Maximum acceleration on reversal (in multiples of 'g') $= \frac{a \cdot n^2}{90{,}000}$ (where a is in mm)

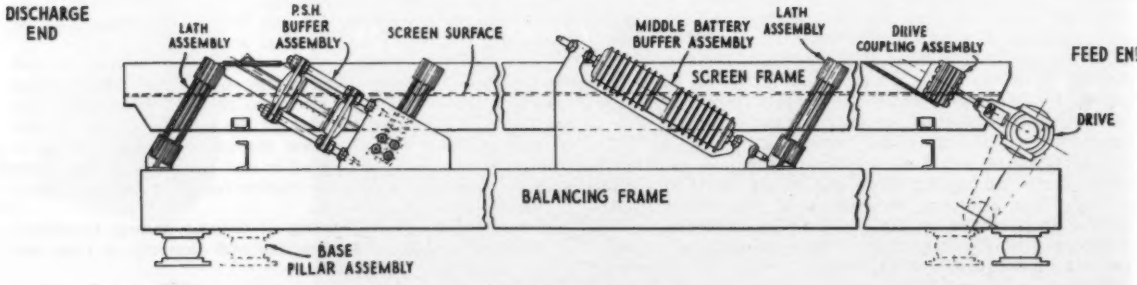
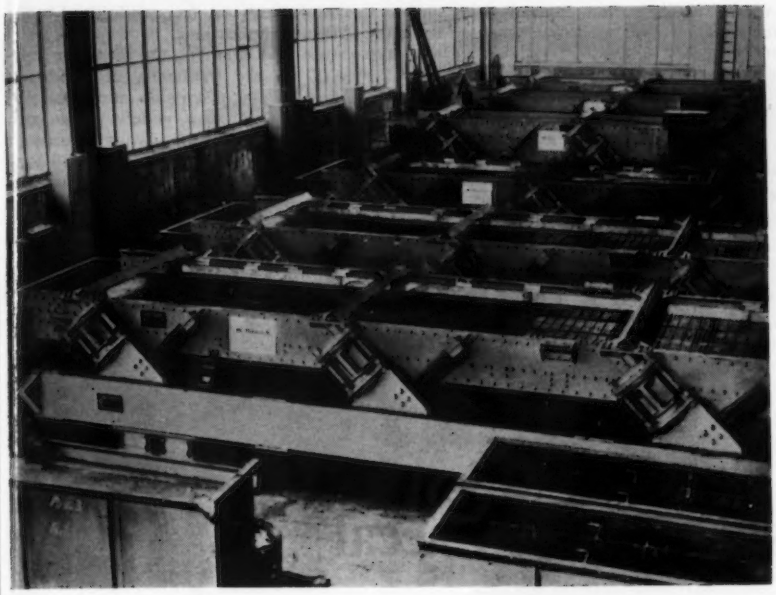


Fig. 2. Side elevation.



★

A battery of Flämrich (PSH) screens of the older type with 45° motion installed at a coal-blending plant in the Ruhr.

★

Taking a few concrete examples of various types of screens we have the following:

Type of screen	Conventional reciprocating	Conventional vibrating (circular)	Resonance	
			moderate	intense
Stroke mm	36	6 to 10	18	26
Amplitude mm	18	3 to 5	9	13
Speed rpm	300	1,000 to 850	650	650
Max. acc. g	1.8	3.3 to 4	4.2	6.2

When comparing these figures it should also be borne in mind that the PSH resonance screen operates with airgaps, in other words 'free-wheels' for part of its stroke, and the accelerating forces which are applied only during the other part of stroke are, in fact, considerably greater than indicated in the above table which is simplified by the assumption of simple harmonic motion obtained with conventional screens.

That these intense stresses can be mastered by careful attention to detail in design, manufacture and simple maintenance is demonstrated by screens which have been operating under such conditions for three shifts for a number of years without duplication. Part of the explanation for this remarkable strength can be found in the fact that they are equipped with

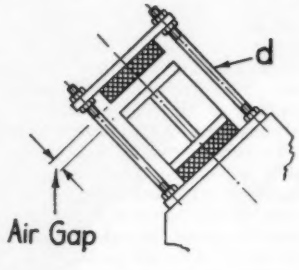


Fig. 7 (right). Air gap controlling amplitude.

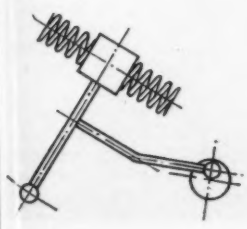


Fig. 8 (left). Ultra-resonance screen drive (diagrammatic).

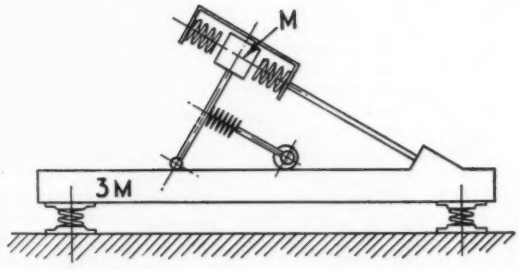


Fig. 9 (diagrammatic). M represents mass of vibrating screen frame.

the maximum number of working buffers which can be accommodated along their length, thereby obtaining a much more even stress distributed than obtainable with screens where all forces are applied and controlled at or near their centre of gravity.

Few factors influence the capacity of a screen with a given 'g' factor more than the rate of travel of the material passing over it. In its turn this is influenced by:

(i) Amplitude (a); (ii) angle of stroke (α); (iii) slope (β).

For coke screening plants the economy of a horizontal layout on top of bunkers will usually outweigh any slight increase of capacity obtainable from sloping a screen. When dealing with fingery coke on a horizontal screen a long stroke at 30° will usually ensure that pegging is kept within reasonable limits and as it is not always easy to forecast precisely the nature of the coke at the time when a new plant is designed a reserve in the adjustable amplitude of the screens is a useful safeguard. It is found that screens operating horizontally with $\alpha = 30°$, $n = 650$, $a = 9$ to 13 mm., the rates of travel are in the range of 65 to 80 ft. per minute compared with conventional horizontal screens which do not usually exceed 50 ft. per minute.

Taking at random three installations in the Ruhr and one in England will help to give an idea of the kind of job these screens do when sizing oven coke:

Ref.	Feed (Tons per hour)	Size range (inch)	Width	Sizing at (inch)	Total length to suit bunkers
A	15	0–1¼	3	¼ : ⅝	16
B	60	0–3¼	4	¼ : ½ : 1½ : 2¾	36
C	70	0–5	5 ft. 4 in.	¼ : ½ : 1½ : 2¾ : 3¼	49
D	145	0–3¼	6 ft. 8 in.	¼ : ½ : 1½ : 2¾	36

All of the above screens are preceded by scalping screens

with various openings dictated by market requirements. Depending upon the layout of the plant, the capacity and cut required, it will usually be desirable to install scalping screens at a downhill slope of between 5-7° wherever this can be arranged.

Here are three typical installations, all operating at a downhill slope:

Ref.	Feed (Tons per hr.)	Width (feet)	Scalping at (inches)	Length	Slope β
A	180 Run-of-oven	7 ft. 4 in.	3	22 ft.	5°
B	120 do.	5 ft. 4 in.	2½ + 3½	24 ft. 6 in.	5°
C	120 do.	5 ft. 4 in.	3½	15 ft. 0 in.	8°

In order to complete the picture it might be mentioned that, while conventional vibrating screens will often provide a relatively inexpensive method of breeze screening, resonance screens with various special features are frequently used today for some of the more difficult applications.

Again, in the preparation and blending of coals for carbonising, cuts at around ¼ in. are frequently required and resonance screens of the type under discussion and operating with high 'g' factors have been adopted widely. One such recent installation consists of two 5 ft. 4 in. wide screens in series giving a total length of 24 ft. 6 in. A feed of 80 tons per hour of ¼ in. − 0 moisture coal is screened at .125 in. and .170 in. slot mesh which is electrically heated.

The purpose of this article is to indicate the possibilities which this screen has in the carbonising industry. It is versatile and adaptable, high in capacity and quite exceptional in its near absence of transmitted vibration.

Now that the first British built screen has been in operation on three shifts for well over five months at an important coking plant of the N.C.B. claims for its reliability have been fully substantiated.

Gas Oil from Paccal

ON January 1, 1956, the Australian Gas Light Company started a new era in its history when it began taking a regular supply of rich oil gas from an outside source to supplement the gas made in its works at Mortlake. This step was taken for three main reasons, as outlined by the Chairman in his address to shareholders on February 25, 1954:

'(*a*) It will allow the ever-increasing demand for gas to be met at a much lower cost and will enable us to postpone the installation of a new gas manufacturing centre for a number of years.

'(*b*) There should be an immediate and considerable saving per annum in gas manufacture costs after the date of commencement of the supply of oil gas, and its use, due to the high calorific value of the gas, will provide a basis for improving the characteristics of the gas supplied to customers generally.

'(*c*) Our present dependency on Northern N.S.W. coal will be greatly reduced. This will assist materially by relieving us of the constant anxiety we have had over recent years concerning interruptions to supply and inadequate stock.'

Before the last war the demand for gas grew at a fairly steady rate and the company had little difficulty in keeping pace with it. However, the war years and the years that followed saw a more rapid increase in the demand for gas.

Large Scale Development

During most of these years materials and labour were difficult to get, and the company met the situation by adjustments and additions to existing plant. However, there is a limit to which existing resources can be stretched, and for some time it has been apparent that some new large-scale development would have to be undertaken. Five different courses were possible:

(i) Building new gasmaking plant along existing lines, thus continuing our dependence on northern coal.

(ii) Establishing coke oven plant that could use lower grade coal.

(iii) Setting up a plant for the complete gasification of lower grade coal.

(iv) Establishing a new oil-gas plant using residual oil from oil refineries.

(v) Buying residual gas that was becoming available from the oil industry.

As capital has been hard to get, and the company has been forced to slow down its expansion programme many times in the past few years, and the most practical solution was to buy oil gas and use any capital that could be raised for the equally pressing need to expand the supply system, the company therefore entered into a contract with Petroleum and Chemical Corporation of Australia Ltd. (frequently referred to as PACCAL), for the supply of oil gas. This gas is a residual gas that is left after the primary fuels and by-products have been removed from the crude oil at the refinery of Bitumen Oil Refineries (Aust.) Ltd. The residual oil is sent to the petro-chemical works—a modern development of the oil industry—where it is 'cracked' for the extraction of benzole, toluol, xylene and ethylene, carbon black, electrode carbons, and a variety of other products that are the basic materials for so many of the present day chemical manufacturing processes.

This 'cracking' is a different process from distilling, and involves the splitting of the molecules of the residual oil into smaller molecules, some of which are gaseous.

This gas has more than twice the heating value of manufactured coal gas and can also be blended with other gases to raise the quality of the gas supplied. If necessary, it can itself be 'reformed' or further cracked into a lighter gas of lower calorific value.

By blending it with coal gas and carburetted water-gas, the company increased the heating value of its gas as from January 1—the day on which the new supply began to come in regularly. This increase was from 511.8 (B.Th.U.) per cu.ft. to 556.156 per cu.ft.—roughly 9%.

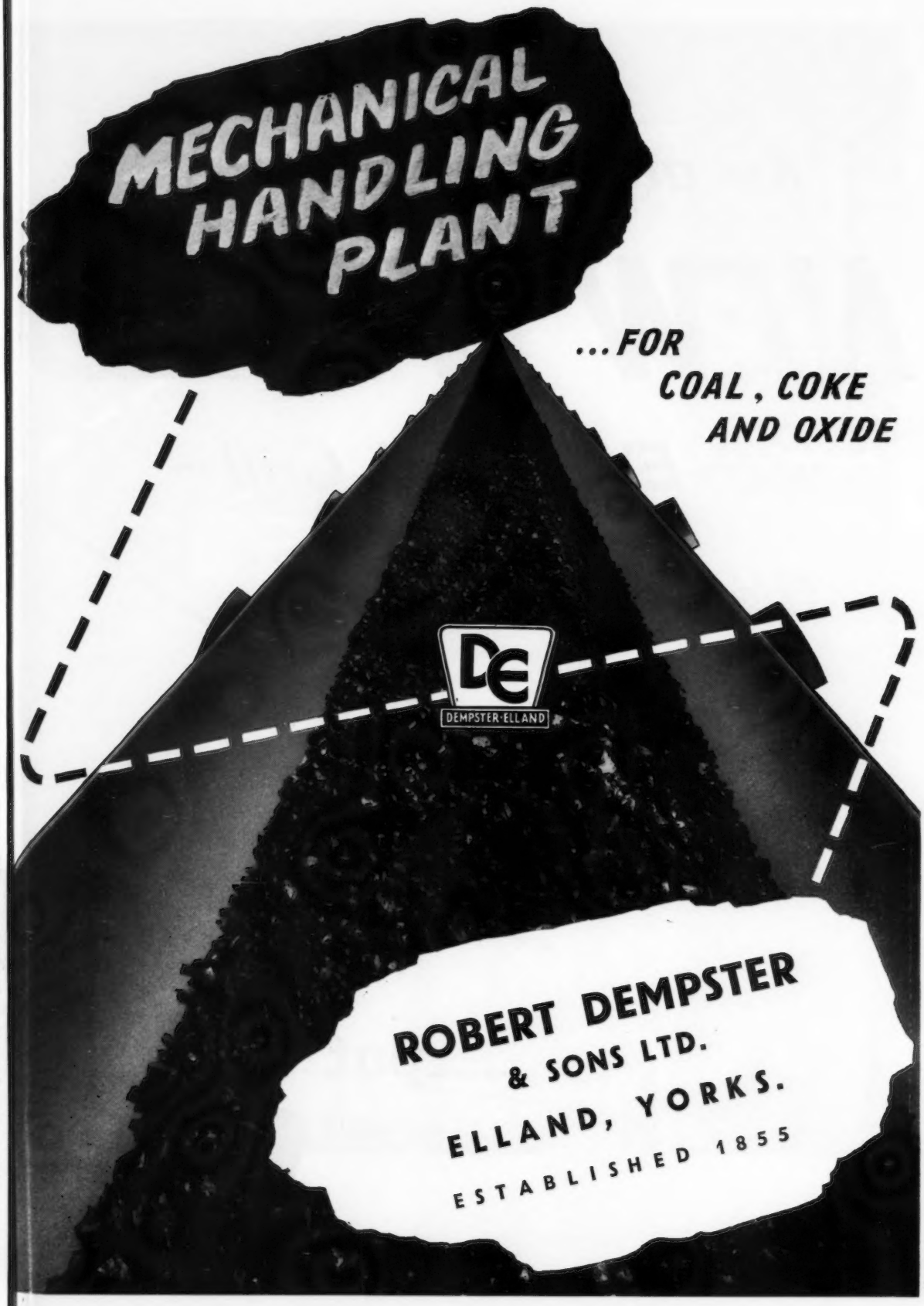
In addition, it has increased the company's potential output of gas by up to 40%, and this will allow the company to expand on a scale that would have seemed out of the question as recently as five years ago.

In selecting the new figure of 556.156 B.Th.U. per cu.ft., several factors had to be taken into account; first, the efficiency at the burners, and secondly, the manufacture of the gases that would be blended with the oil gas to make the new standard gas. The smoothness of the changeover and the favourable reaction of the public to the new gas is a tribute to the thoroughness and efficiency of the officers concerned.

To convey the oil gas to the works, the company laid a 12-in. all-welded steel main six miles long from Mortlake to the PACCAL works at Silverwater. Trial runs of gas were made during November and December and the regular supply began to come through on January 1, with the main carrying gas up to 50 lb. per sq. in. at the Silverwater end.

When the gas arrives at Mortlake it passes through orifice meters that record the quantity received, and joins the Mortlake 48-in. overhead mains before reaching the holders. Provision is being made for the automatic control of the calorific value of the mixed gas by instruments being installed in the control room.

The oil gas is supplied already purified. However, to guard against any breakdown in PACCAL's purification system, a low-pressure connection to the works purification system has been provided. A high-pressure connection has also been installed in case it becomes necessary to 'reform' the oil gas to a lower calorific value at a later date.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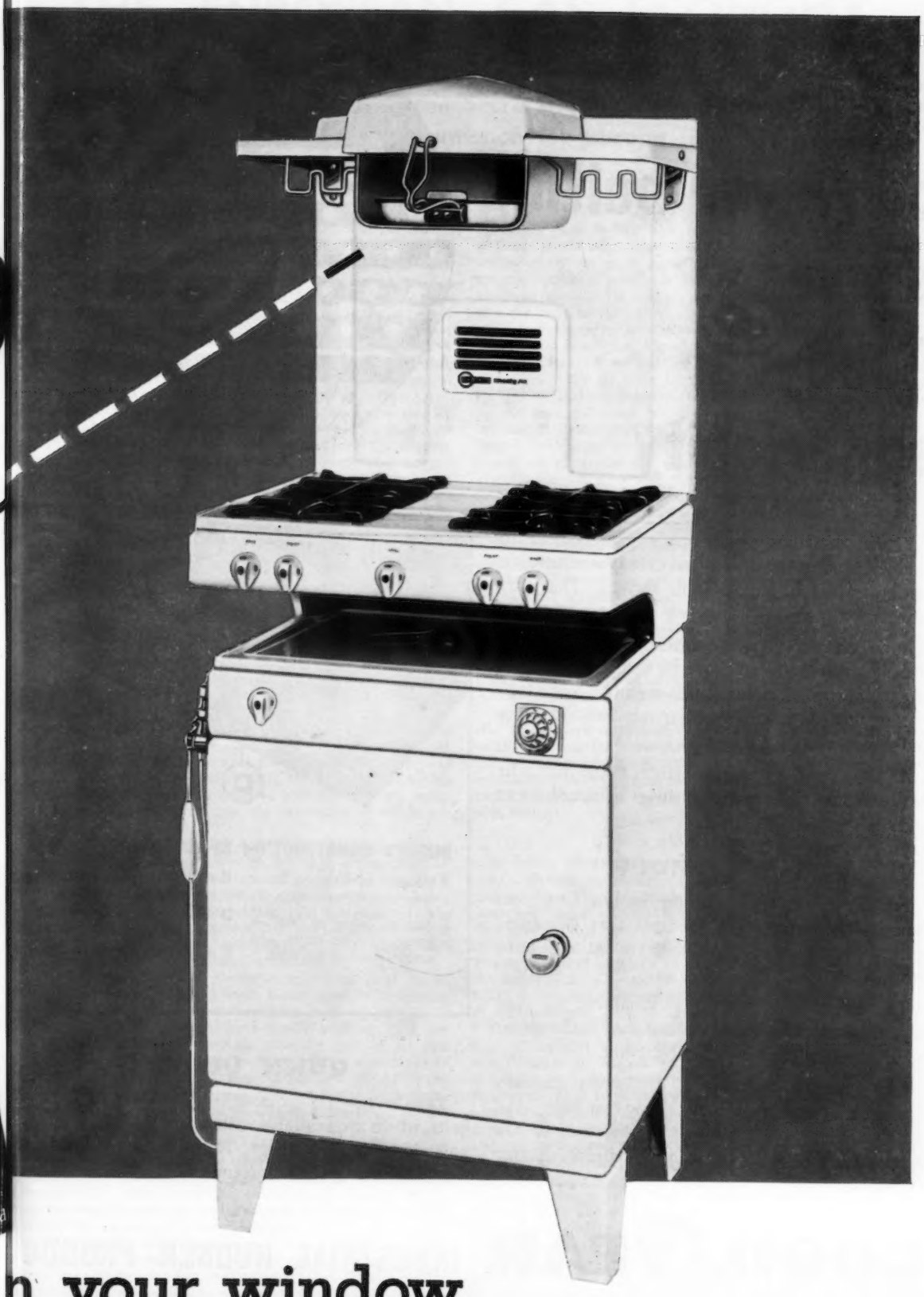

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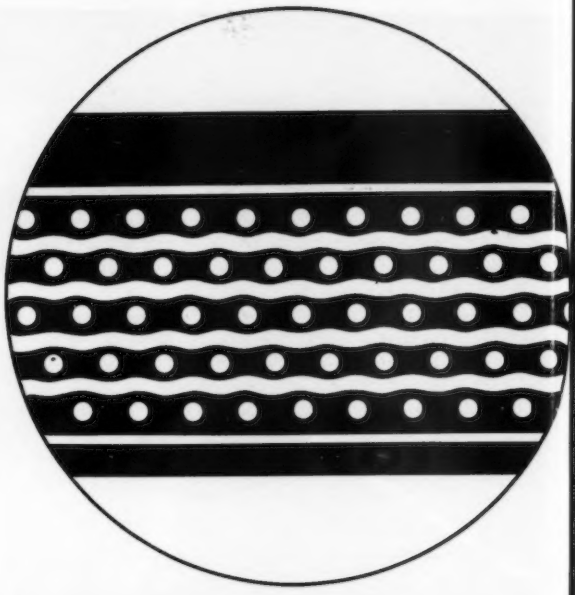

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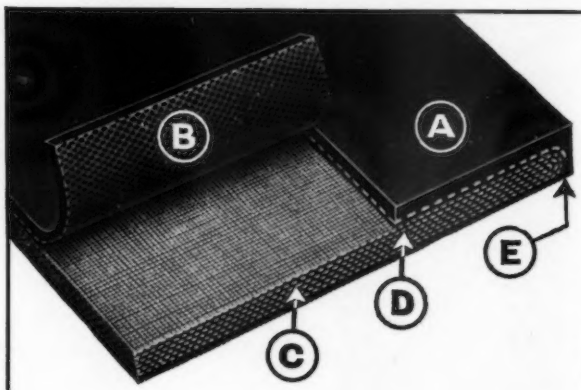

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THE EUROPEAN GAS ECONOMY

Abstracted from a Document Prepared by the Secretariat of the Economic Commission for Europe

WIDELY varying opinions are held about the future requirements and available supplies of energy in Europe. It is generally thought probable, however, that Europe will suffer from a shortage of energy during the coming years, and in spite of the exploitation of all available resources, the shortage is likely to increase in severity until such time as the influence of atomic energy makes itself felt.

Energy may be considered under two main heads, motive power (provided mainly by electricity and oil), and heat. Motive power will be the first to feel this influence of nuclear energy, but later it will only be that heat supplies will be forthcoming from this source. If the forecast of a shortage of energy is correct, every effort must be made to achieve the maximum utilisation of existing conventional fuels for heating. Industry will demand greater efficiency, automatic control and labour saving, and the household, greater convenience and cleanliness, so it is necessary to concentrate on fuels which meet these requirements.

How far can gas fulfil these purposes? What is the present situation and what are the possibilities and the obstacles entailed in a large scale development of gas production?

The Use of Gas

Although the gas industry still accounts for only about 7 to 8% of the calories consumed in Western Europe, its share increased by 52% between 1925 and 1937 and by 42% between 1937 and 1953, whereas the consumption of energy as a whole rose by only 23% and 25% over the two periods respectively. These figures, however, are probably a considerable underestimation, owing to the lack of statistical data on gas production and utilisation within large industrial groups and to the greater efficiency of gas compared to other sources of energy. The use of gas underwent much change between 1910 and 1954, because of a partial shift from the consumption for the traditional lighting and motive power to heating, cooking, industrial and chemical uses, the expansion of which has been rapid.

Geographically gas supplies are unevenly distributed in relation both to their proportion of the total consumption of energy and to consumption per head of population, but, apart from countries where large natural gas reserves are being exploited, the coal producing countries, as a rule highly industrialised with a large urban population, have the highest consumption rates. This is not surprising, since the major part of European gas is still produced from coal.

Countries which possess resources in coking coal or in natural gas, are normally in a much better position to develop their gas industry than countries which have to rely to a large extent upon imported fuels for gasmaking; but the influence of a country's economic structure and of its fuel policy is just as important. Conditions will be completely different in countries where the main emphasis is placed by the State on the efficient use of energy resources from those countries where developments depend almost entirely on private decisions based on the costs-price relationship.

Available statistics show that in Italy, where the cost of production is sufficiently low to offset any problems that might be encountered on the market and in countries with planned economies too, where costs are of secondary importance as compared with the efficient use of energy resources, production is planned to increase at a very high rate.

In three cases, Italy, Rumania and the U.S.S.R., the bulk of the planned increase is to come from the exploitation of natural gas resources. But in Czechoslovakia, Poland and in the U.S.S.R. as well, coal gas production is to double by 1960.

Economic and technical development make more and more demands on a form of energy which is highly efficient, and in forms easy to use and readily controlled by automatic devices, which allow considerable savings in labour. These are precisely the main advantages of gas. Added to this the specific applications of gas lie almost solely in thermal and chemical uses, where nuclear energy is unlikely to develop, so that the demand for gas would appear to continue to increase.

The efficiency of utilisation of gas is very high compared with that of most other types of energy, either when considering gas as such or when working from the original raw material, and figures for Belgium in 1953 show an overall efficiency for gas as 45.0% compared to 17.1% for electricity, but these figures may be valid for one country and not for others. In the United Kingdom, for example, somewhat different figures are quoted in the Ridley Report, which gives the efficiency of utilisation for continuous room-heating as for an electric fire 100%, a gas fire 45% and for a coke fire 40 to 50%. Coal appliances, however, are generally older than others, whilst modern appliances are more efficient than is suggested by the above figures, but in daily use it is definitely more difficult to achieve optimum efficiency than it is for appliances using gas or liquid fuels.

When all factors are taken into account, the over-all efficiency of gas is higher than that of most other forms of energy, even though no figures are available for natural gas, though such figures might be even more advantageous. The gasifying of raw materials increases their value both from the thermal and chemical point of view and opens up markets which would otherwise remain closed to them.

Convenience and cleanliness in the use of gas, though not readily measurable, may be the most important advantage of all. In domestic utilisation, for example, gas enables the user to adapt consumption instantaneously to his needs and relieves him of many unpleasant tasks. The cost of maintaining the installations is low and no cumbersome and expensive storage tanks are needed on the consumer's premises, as is the case with fuel-oil.

Gas and Automation

So far as industry is concerned, the use of gas means substantial savings in labour and maintenance costs and in addition provides intensive heating of unequalled flexibility at all rates and under all conditions of operation. For the most diverse industrial uses there is a wide range of burners, well suited to each specific application, of robust construction and of simple control to which the most modern electronic methods can be applied. Gas would seem, then, to be extremely well suited to the new processes of automatic control now in course of development.

The use of gas also enables the atmosphere and temperature of furnaces to be regulated with considerable accuracy, which makes it essential in certain manufacturing processes and helps to ensure uniformity in the quality of the goods produced. As a large part of gas produced is supplied to the consumers by public utility undertakings, there is some guarantee of constant supplies being maintained at consistent qualities, and gas tariffs, too, are relatively stable as they are subject to strict public utility rules and any variations are in general slow and limited.

Convenience in use, high efficiency, valorisation of the primary fuels and regularity of supply; all these advantages indicate the desirability of gas production developing rapidly and this would be true even if energy supplies large enough amply to cover Europe's future energy requirements could be foreseen. But if the possibility of shortage, at least until nuclear energy is readily available, is accepted, then the need for the most efficient utilisation of energy resources also constitutes a strong argument in favour of the development of gas

on a large scale. Indeed in countries where particular emphasis is laid on the need for the rational utilisation of energy resources and commercial considerations are given less weight the planned rate of development of gas is considerably higher than elsewhere.

There would therefore seem to exist a *prima facie* reason for expecting a greater development of gas than is at present contemplated in the other countries. How far do the present structure of the gas industry and its economics lend themselves to this and what are the conditions that ought to prevail to make such a development possible?

European gas comes from widely different sources, for example the distillation of coal (often as a by-product of the metallurgical or chemical industries), the operation of refineries or the production of natural gas (in some cases directly connected with the oil industry). Calorific values vary widely from 800 to 22,000 k.cal. per cu. m. (83.8 B.Th.U. per cu.ft. to 2,303 B.Th.U. per cu.ft.), and densities, compared with that of air, from 0.34 to 1.95. It is often considered by the layman that gas is a homogeneous product but, owing to variations in methods of production, calorific values and densities, this is not the case. In some ways this variability is of advantage to the industry, as it means that the possibility exists of producing the right type of gas for a specific purpose.

In spite of the wide differences in gas sources and qualities the industry throughout Europe has a certain similarity in its constitution which arises mainly from its position as a public utility and from common problems of distribution. The latter are essentially bound up with legal questions arising from the need to have underground mains, chiefly along public highways. This fundamental point is the major reason why gas has become a public utility.

The industry has emerged as a public utility by a gradual process, as the national or municipal authorities in the great European cities found themselves obliged to take steps to co-ordinate the industry and to bring order into the chaos resulting from haphazard mains laid in towns and streets by competing companies. This led to the more or less universal establishment of gas supply concessions and on this basis the industry developed; although the 19th-century trend towards municipal ownership in a number of countries was succeeded by the phase of nationalisation in the east European countries and in France and the United Kingdom.

Side by side and closely connected with this development there was a substantial technical and economic advance marked by a tendency to concentrate gas production in large central works and to close the old, small type of gasworks. This tendency, together with the development of natural gas, necessitated the installation of vast transportation systems which, unheard of 30 years ago, now constitute in practice a new form of public utility. These developments have to some extent permitted the use, as distributing centres, of the smaller, old type of gasworks, otherwise considered uneconomical.

The present position of the industry gives rise to a number of complex questions. On the consuming side there are the domestic, commercial and industrial consumers using a public utility and claiming the right to be supplied regularly with the amount of gas they want, under supply conditions controlled by a public utility (national, regional or municipal). On the supply side, however, complications may arise from the fact that the control of raw materials is not mainly in the hands of the gas industry, but in those of collieries, steelworks and oil refineries. This is quite a usual state of affairs; but what is unusual is that in many cases the gas itself originates from sources outside the gas industry proper, such as cokeries at steelworks, refineries producing petroleum gases, and companies exploiting natural gas. The gas industry, therefore, may be in a difficult position, since it has on the one hand its obligation as a public utility to supply, while on the other hand it may not control the production of the gas it has to distribute. For something like a quarter of a century gas production has, in its technical aspects, been moving in the direction of large units, such as high capacity coke ovens. This very broad technical development, which has proceeded along much the same lines in all countries, has been accompanied by an economic development that has led to gas supplies becoming more and more dependent on coke oven plants, often completely separate from the gas industry proper.

This applies particularly to Western Germany and Belgium, and to some extent to Austria, France and the Netherlands, and more recently to Czechoslovakia. In other countries, such as the United Kingdom, the Scandinavian countries and Switzerland, although the general trend has been similar in the technical field, the greater part of the gas produced still comes from works forming part of the gas industry. It is this dual development in the technical and economic spheres which has been the outstanding feature of the last 20 or 30 years, and it is possible that the pattern of gas production is on the verge of profound changes, signs of which are indeed becoming more and more numerous.

Coke Ovens

At present the largest production units are coke oven plants. They produce mainly large coke, usually suitable for iron and steel works, together with a relatively small amount of small coke, breeze, gas (about one-fifth by weight) and, finally, by-products.

Coke oven plants may be situated at the mine, or they may be integrated into iron and steel or chemical works or they may even have been built primarily for producing gas. To some extent then, the problems they have to face differ; but basically they all have to rely largely upon the coke market, particularly the large-coke market (*i.e.*, the iron and steel industry) as an outlet.

The main feature of these large production units is that, although the coke and gas are associated products, the former and not the latter usually predominates; in other words any gas they provide is really a by-product, even though they may be part of the system of public distribution of gas.

Apart from coke ovens there are many types of plants producing gas, such as gasworks, which still constitute the basis of gas production in a number of countries. Technically gasworks are coming increasingly to share certain features with coke oven plants; economically, however, they differ very considerably from them. They are an integral part of the gas industry and are designed for the production of gas, the coke being the by-product, which is in any case partly used itself for gas production. Furthermore, whereas the large-scale closed circuit system is particularly well suited to the inelastic nature of coke oven production, gasworks are designed to be relatively flexible. This flexibility is a great advantage and gasworks lend themselves particularly well to the use of a number of separate production units supplying producer gas, carburetted water gas, gas from oil distillation, refinery gas, *etc.*, or mixtures of gases, in addition to coal carbonisation plants. In that sense, provided costs are reasonable and there is an adequate system of interconnection, they are a valuable complement to coke ovens.

Natural Gas

Natural gas at present accounts for approximately 30% of Europe's gas production, but its real influence on the European energy balance, regarded internationally, is the fact that it is at present mainly used in coal importing countries, so that its development may seriously interfere with the intra-European coal trade.

Its production is extremely simple as, once the boreholes have been sunk, it involves no more than a few purification plants and pumping stations, and a much less elaborate structure than that needed for the production of other gases. In addition its flexibility of production is unrivalled.

The consumption of liquefied petroleum gases is becoming increasingly important and is estimated as accounting for 6% of gas consumed in certain countries which use this gas.

In France there are about 5 mill. consumers of piped gas and about the same number for liquefied petroleum gases. In Italy there are 5 mill. consumers of liquefied petroleum gases in cylinders or containers, against 2.5 mill. of piped gas, and, although the quantities involved are small, a large number of people are affected. Liquefied petroleum gases find their buyers mainly in rural districts or in towns without a gas grid and are either complementary or potentially competitive with piped gas.

The possibilities of bulk imports of natural gas from extra-European sources are already looming on the horizon. Although nothing is yet definite, if present expectations are realised, the plans which are now being sketched might revolutionise the European gas industry.

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B.Th.U. per cu.ft.) as against 4,000 to 4,500 (419 to 471 B.Th.U. per cu.ft.) for coal gas, exist in the Middle East and Venezuela and more will perhaps soon be available in the Sahara.

Venezuela's yearly production is of the order of 22 bill. cu. m,. of which a little over 5 bill. are used for the country's own consumption or for repressuring in the wells. The Middle East could produce 10 bill. cu. m. a year, so that this total production from these two areas, converted into terms of coal gas, would represent about 60 bill. cu. m., of which a large part would be for sale. This quantity corresponds to about 38 mill. tons of coal.

The possibility of transporting part of this natural gas to Europe was considered some years ago. The project entailed the construction of a gigantic feeder from Iraq to the centre of western Europe, with a number of branch lines along its length. Although the scheme might be technically and economically sound, provided the states over whose territories the feeder ran did not impose prohibitive taxes or charges, it does not seem to have received any intergovernmental consideration.

Liquefied Gas

Other more recent suggestions have been put forward. An American firm is now contemplating the transport in special tankers of liquefied natural gas at −160°C.; at this temperature the volume would be 1/600th of what it would be in the gaseous state. According to some experts the delivered cost per cal. of this gas would be much lower than that of coal gas in Europe and the process would allow the cold to be utilised for refrigeration purposes on arrival, a point of real economic interest. However, the technical possibilities of such a project have not yet been proved and, in view of safety problems and practical difficulties, it seems unlikely that it will soon become a workable proposition, but future developments should be carefully watched.

It was shown previously that the pattern of gas production in Europe takes very different forms. Coke oven plants are the foremost sources of gas production, and their importance is still increasing in most industrialised countries. Needless to say, this trend, which is influenced by the volume of investment in the iron and steel industry, has led to the appearance on the market of a large quantity of gas, sometimes at very low prices; this, in turn, has brought about a reduction in the number of gasworks.

Net production from coke oven plants accounts for approximately 34% of all the gas sold in Europe, while that from gasworks and gas-producing coke oven plants accounts for 37% (because of the very large output from gasworks in the United Kingdom) and natural gas for 30%.

The gas industry, therefore, has become largely dependent, economically speaking, on market conditions in heavy industry. As a coke oven plant, as a unit, cannot be instantaneously adjusted to demand, in spite of the development of compound banking and the practice of mixing oil with the blend, the margin of flexibility is economically small. Coke ovens cannot in practice be operated economically except around their maximum capacity, partly for technical reasons and partly because they are capital-intensive plants, as coke oven plants are installations which require a very high initial capital outlay. Neither are manufacturing costs appreciably reduced when operation is below maximum capacity, so that the over-all cost of producing gas increases rapidly as the utilisation factor drops. Coke oven gas has, therefore, introduced into the gas economy certain factors making for relative rigidity.

Variable Processes

There are, however, two processes which enable the production of gas to be varied within certain limits: Either gas or coke may be used for the under-firing of compound coke ovens; or petroleum products may be mixed with the coking blend—this increases both the production of gas and its calorific value.

Make-up gases, too, lend a certain flexibility to the production process as a whole, and fall into two categories:

(a) Gases produced from coal or coke, with or without the addition of petroleum products. These comprise producer gas, water gas and carburetted water gas, and the production from small total gasification plants.

Producer gases have the advantage of making production rather more flexible, not only by providing extra quantities of gas to meet peaks but also enabling some surplus tonnages of coke to be absorbed if need be, but flexibility is limited by the time taken to start up the plants involved and the processes entail rather high capital costs. Even so, the cost of producing the gas is relatively low and modern automatic gas-producers are arousing new interest. Certain petroleum products may be used to enrich these gases as in the production of carburetted water-gas.

(b) Gases, not produced by the distillation of coal, which can be used either as make-up gases, in mixtures, or to meet the base load. Their production is extremely flexible which makes them particularly suitable for maintaining the complex balance between production and consumption.

These gases in turn fall into five groups:

(i) Natural gas; mostly used to meet the base load.

(ii) Methane extracted from coal mines. This is more or less dependent on the output of the mines themselves, and its flexibility is limited, as its availability is to some extent unpredictable. Both these gases, however, in their natural state, can only be mixed with coal gas in small quantities, as is already the practice at certain gasworks in Italy and in France; but with the introduction of methane-cracking, as practised at the Mont Ste. Aldegonde works in Belgium, this drawback can be easily overcome at relatively low cost.

(iii) Liquefied petroleum gases, chiefly propane and butane. These can be employed as make-up gases in small quantities, and are produced in entirely automatic manufacturing plant, at reasonable cost. The great advantage of these gases is that they are particularly suitable for storage, since, in the liquid state, they take up only 1/250th of their volume in the gaseous state. In addition propane does not attack gas mains, though air propane mixtures do. Even so, liquefied petroleum gases are not much used as make-up gases but are generally distributed through seperate mains in their gaseous form.

(iv) Refinery gases, the by-product of petroleum-refining, the importance of which is growing, are used either in the neighbourhood of the refinery and distributed through separate mains, or as make-up gases, as produced or after cracking.

(v) Gases derived from the direct gasification of petroleum products, which are an excellent form of make-up gas, as they are readily mixable with coal gas or may even replace the latter without great difficulty and without any changes to the appliances in which they are burnt.

Self-Contained Structure

The structure of the gas industry was at first highly self-contained, as production and distribution were carried out by the same undertaking, but when more and more use was made of coke oven gas the influence of factors outside the industry itself began to be felt, so that it may be that with the development of natural gas and petroleum gases another phase is about to open in which the industry may be able to some extent to free itself from dependence on coke oven plants and revert to something like its original structure, although possibly with a more aggressive policy of expansion. The greater the proportion of gas which comes from coke oven plants, the greater is the proportion of gas consumed by industrial users. This is largely due to direct sales by coke oven plants, often to associated companies, and to the integration of coke oven plants into iron and steel or chemical works. With the advent of interconnecting supply systems, however, the concept of several markets for gas—some representing outlets for coke oven gas and others outlets for public utility companies—is becoming increasingly inaccurate and in reality there tends to be only one market for gas, since gas, whether produced by coke ovens in integrated plants or by gas utilities, tends to flow into a common distribution system. The two main groups of gas consumers are the domestic and industrial. The domestic demand depends relatively little on the economic situation, as the main variations are seasonal and bound up with the temperature, and are also especially affected by inter-seasonal auxiliary heating in spring and autumn. Sometimes there may be a summer peak, as happens in certain Belgian towns where cooking is done by gas instead of coal during the hot weather. Weekly fluctuations occur too and even strongly marked daily peaks, but it may be said that the main feature of domestic consumption lies in its peaks. This will

cause particularly difficult problems of flexibility where the gas comes from such production units as coke oven plants which form an integral part of industrial undertakings, the behaviour of which is fundamentally different.

Some branches of industry are subject to marked seasonal influences, as is the case for the textile, engineering and foodstuff industries, but others, like the iron and steel and chemical industries, are not influenced by such factors. But, unlike the domestic market, all branches of industry are affected by changes in the economic situation. Among industries themselves, there are very appreciable differences, especially the iron and steel, engineering and metallurgical industries, which are extremely sensitive to fluctuations in economic activity, and the consumer goods industries, where consumption is much more regular. Other variations too may be caused by the intermittent operation of certain large industrial or commercial plants, so that it is clear how complex the problem of fluctuations in consumption, and the flexibility demanded from production plants, may become. The terms 'supply' and 'demand' have deliberately been avoided so far as possible and 'production' and 'consumption' have been used in their place, but actually, current consumption is in most cases well below potential demand, as the price problem is one of the main causes of this disparity.

Potential Demand

The potential demand for gas is, of course, influenced by the relative price of gas, but information on this subject is scanty. Even if it were available, particularly for large industrial consumers, comparisons between countries might be misleading, because of wide differences in the structure of individual gas industries. Furthermore they are of little value because the gas industries of the various countries do not compete with each other. It would be of greater value to compare prices of gas with those of competitive fuels.

The salient fact which emerges, after studying the available figures, is that, in many cases, gas prices would not appear to be very favourable to an expansion of gas consumption; but this does not tell the whole story and certain other elements have to be taken into account.

This is true of most western European countries though in Western Germany where gas prices are relatively lower gas is in a better position. This also happens wherever natural gas comes fully into the picture. Comparative prices for eastern Europe are in general not obtainable but it appears that in Czechoslovakia, where large volumes of coke oven gas have recently become available owing to the development of heavy industries, prices have been reduced and certainly compare favourably with those of other fuels. Although coke oven plants at iron and steel works, mines and chemical works, and gas producing coke oven plants too, are in many countries still the basic means of gas production, it is becoming increasingly difficult to make them pay as such; a fact which is often disguised because coke ovens often take part in an integrated manufacturing process.

The position of coke ovens is radically affected by two factors. The first is the coal/coke price relationship and the second is the price obtained for the by-products. It has been contended that for coke ovens the ratio of the respective selling prices for comparable tonnages of large coke, ex-works (wholesale price), and coal delivered at works should be about 1.4 to 1 if the operation is to pay. Below that figure it would pay to replace by producer gas the gas used for heating the ovens and so consume part of the coke yield and, where the ratio was about 1 to 1, it would pay to use other equipment entailing a lower initial outlay: Such as gas from total gasification plants, carburetted water gas, fuel distillation gas, refinery gas *etc.* It would appear that the ratios are in fact often considerably below 1.4 to 1.

Price Relationship

Although the desired price relationship may be difficult to maintain for coke used for domestic heating, which is faced with an increasingly strong competition from fuel oil, it is surprising that such a problem should be encountered for metallurgical coke, at present in strong demand by the iron and steel industry.

As regards by-products, there has been a substantial post-war drop in values, owing to the development of petroleum chemistry, as shown in the United Kingdom, where the price index for tar in 1952 (1938 = 100) stood at 350, that for benzole at 140 whereas the corresponding index for coal prices was at 400. Unfortunately, such precise figures are not available for other countries, but this trend is understood to be general.

The cost of producing gas is mainly determined by the cost of coal, less receipts from the sale of coke and by-products, and in pre-war years, except those which suffered an economic depression, the value of coke sold was higher than that of coal to be carbonised. Now, however, it is frequently lower or equal to this price, due mainly to the artificial fixing of coke prices, which tends to increase the cost of the gas produced.

In spite of increases in gas prices the operation of coke ovens can only be made to pay with difficulty, at least in the case of new coke oven plants for the purposes of gas production, dissociated from integral manufacturing processes. In recent years coke oven construction has been undertaken mainly within the framework of new iron and steel works or chemical plants, where the uneconomic nature of the coking operations is offset by the profits made on the production process as a whole.

In the United Kingdom coke oven plants still pay to some extent, thanks to the state of the metallurgical coke market, the need for smokeless fuels and the development of the chemical industry, and this may also be true of a number of cokeries in Western Germany and in the Netherlands.

The extent to which equipment is utilised is another important factor in production costs, so that in the case of coke oven plants, which sell gas only as a by-product—that is, only to the extent that they have to produce coke—the utilisation factor is very high, but for carbonisation units where gas is the main product the plant may operate at a poor utilisation factor owing to wide variations, mainly seasonal, in the demand for gas.

Under present conditions operators no longer consider it advisable to base the gas industry solely on the carbonisation of coal. This does not, of course, imply the disappearance of coke oven plants as suppliers of gas, because such gas is a necessary by-product of metallurgical coke, but it does mean that there are considered to be commercial limits to the development of this type of plant as gas-producing units, and it may create a situation which will have a great influence on the future of coal in the gas industry.

Significance of New Methods

New methods of gasifying coal and oil, such as the Lurgi, Koppers-Totzek, ONIA-GEGI or Segas processes, are of importance, although it is not yet possible to state their precise significance. Their development and operation, working with existing plants, may eliminate the drawbacks suffered by coke oven plants operated as gas producers; particularly the limited range of coals that can be used, the high capital outlay per unit of gas produced, the relative lack of flexibility in production and the doubtful economic return.

As there are very few plants operating on the industrial scale, little is known about costs of production, although it is said that in Manchester, for example, catalytic oil gasification working under base load conditions costs 9.62d. per therm against 10.03d. for coal carbonisation. As these installations can be very versatile, and are able to crack rich gases (natural gas, liquefied petroleum gases, refinery gas and methane) as well as oil there is no need to become dependent upon any one raw material.

It is clear then that to establish a satisfactory equilibrium between supply and demand, apart from the need for competitive prices, the existence of an adequate transport system, satisfactory storage capacity, and flexibility of production are necessary.

(To be concluded)

BRITISH STANDARDS—REPORT

DIFFICULTIES have been experienced in the interpretation of the methods of testing specified in British Standards 1954 'Fireguards for heating appliances,' states the British Standards Institution's Annual Report for 1955/56. A supplement has, therefore, been prepared containing notes on the use of test probes, maximum rate of burning of heating appliances, and a statement clarifying the meaning of the word 'smoulder.'

TRADE NEWS SUPPLEMENT

Fully Tracked Brayloader

IMMEDIATE availability of a fully tracked Brayloader is announced by W. E. Bray and Co. Ltd., of Feltham, Middlesex. Known as the Brayloader 25 it is a fully tracked shovel specifically designed for the heavier work and adverse conditions allotted to such equipment yet retaining the distinctive features of other Bray shovels.

With a lifting capacity of 3,000 lb. the BL 25 employs a 1 cu. yd. bucket and has a wide range of easily fitted attachments, including a bulldozer blade, fork lift, crane hook, and snow plough. The hydraulics are of Bray design and manufacture, enabling ease of control and effective application to main boom and bucket rams. Operator vision is complete, the cab and cowling are constructed from Polyester resins reinforced with fibreglass and all controls are grouped for maximum ease and efficiency.

Maximum Traction

Full tracks, of generous width, allow maximum traction and flotation in mud, sand and other soft materials. They also, by virtue of a large area of ground contact, reduce the ground pressure of the BL 25 and simplify steering. Track plates are of manganese cast steel. The stability of the shovel is enhanced by positive bucket control, allowing a full load to be carried near to ground level. With double acting main rams, and double acting crowd rams positioned directly behind the bucket, the BL 25 will dig to a depth of 9 in. at a time.

The basis of the BL 25 is a massive sub-frame directly associated to the track frames and providing mounting points for the loader unit. The power unit is carried by this sub-frame on a flexible cradle, thereby ensuring that all loading and steering stresses are absorbed by the sub-frame, and in no respect by the power unit itself. A Ford diesel engine developing 42 b.h.p. at 1,750 r.p.m. is employed. All suspension working joints are compressed rubber bushes which require no lubrication, do not wear and afford a desirable degree of elasticity.

Half-shafts and axle bearing have been specifically constructed to accept the additional stresses and strains set up by a heavy output demand. There is double reduction axle transmission but no differential. The crown wheel is mounted on a solid shaft extending on each side beyond the rear transmission housing, carrying the clutch and brake units from which the drive is transmitted to each track. The mainframe of the shovel is box-sectioned for adequate reserves of strength.

The steering is obtained by varying the relative speeds of the two tracks and for this purpose each track has an independent brake controlled by pedals. Steering clutches each comprise of wedge operated internal expanding clutch shoes operating—like a motor car wheel brake—in a drum. The shoes are the driving members and are spring loaded to bear against the internal surfaces of the drum by a pair of coil springs acting, through a shaft and draw link, on the shoe expander mechanism.

Protection from Shocks

The clutch springs exert just sufficient pressure to take the drive and will permit momentary slip to protect transmission and other working parts from shock loads, such as might be caused by careless handling of the controls or by accident. The two track frames are each carried on six load carrying rollers running on bearings. These rollers are fitted with renewable, hardened steel flanged tyres and the bearings adequately sealed against the entry of moisture and grit.

The front wheels are quickly detachable and, for the purpose of track adjustment, are mounted in sliding union with the track frames. The complete front wheel assemblies on their sliding brackets abut rearward against the track adjusting screws which, in turn, bear against compressed recoil springs. These springs are fully enclosed and heavily compressed. They do not serve to tension the tracks, for which purpose the adjusting screws are provided, but only to prevent damage in the event of collision or some object fouling the track.

Driving sprockets are cast steel toothed rings riveted to pressed steel discs. The pitch of the teeth is one third of the track link pitch, so that each tooth is engaged once every three revolutions. When the teeth do become worn the sprockets may be easily removed and reversed to bring the drive on the unworn sides of the teeth.

The complete track carriage is well shrouded to prevent earth from the upper track stretch falling on the track rollers and lower track stretch, and protection plates are fitted below the frame to prevent earth entering from the sides when turning. The upper stretches of the tracks are supported by locking wheels carried on laminated springs which serve to reduce clatter and wear.—*W. E. Bray and Co., Ltd., Faggs Road, Feltham, Middlesex.*

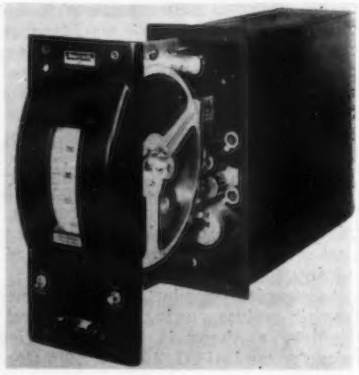
Precision Indicator

THE Honeywell-Brown ElectroniK vertical scale precision indicator (pictured below) has recently made its appearance. Face dimensions are 6½ in. by 15¾ in. and five of these instruments can be mounted in the same panel space needed for two circular scale models.

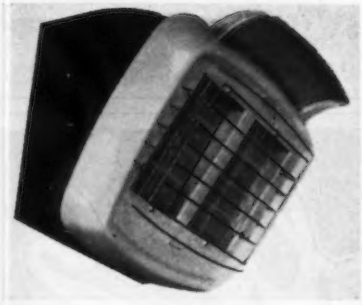
The vertical scale precision indicator incorporates the continuous balance circuit common to all ElectroniK instruments. Sensitivity is $\frac{1}{32}$% of scale span; accuracy is within ±0.20% of scale span.

The highly legible rotating scale has a length of 28¾ in., and 5 in. of it are visible through the window. A twin hairline index prevents parallax errors.

The indicator chassis can be slid out from the front for inspection and service—without stopping operation of the instrument.—*Honeywell-Brown, Ltd., Wadsworth Road, Perivale, Greenford, Middlesex.*



TWO NEW SPACE HEATERS



Industrial

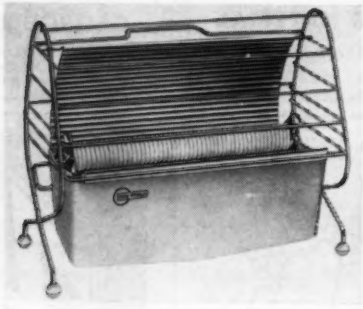
INDUSTRIAL space heaters which utilise the Schwank system of infra-red radiation by surface combustion, and have become so popular in Continental countries and America, are now being made in this country. Illustrated above is an example of the Parkinson Schwank range.

Air temperature with the Schwank system is relatively unimportant and loss of heat due to air movement is therefore far less serious than with other methods.

900°C Surface Temperature

The burner consists of porous ceramic plates each containing some 1,250 holes, through which towns gas, mixed with the air required for combustion, passes at low pressure to be ignited on the outer surface of the ceramic plates, which attain a surface temperature up to 900°C. Due, however, to the low thermal conductivity of the ceramic material, pre-ignition on the inner surface of the plates does not occur.

A complete range of heaters is available and burners are now being incorporated in many industrial processing plants.—*Parkinson and Cowan Industrial Products, Cottage Lane, City Road, London, E.C.1.*



Domestic

THE Nocturne 505 illustrated above is a portable gas heater of contemporary design. It has a strongly constructed guard, providing protection at the back, sides, and front. The handle, and the legs which are extensions of the side frames capped with cream plastic feet, are integral parts of the guard. The whole assembly is made of heavy gauge wire finished in bright chrome plate.

The general lay-out of the heater is arranged to give a low centre of gravity and a broad base, thus ensuring good stability. It may be used with safety on rugs or carpeted floors as little heat is lost downwards.

Cheerful Glow

The corrugated curved light alloy reflector provides many facets for the reflection of radiant heat and this, combined with the direct radiation from the element, gives a bright cheerful glow. The element itself consists of a refractory rod with about 50 steatite discs on it.

The burner housing is of pressed steel, finished in stoved cream paint and has fixing brackets for the burner and the element. The horizontal cast-iron burner carries 11 Bray No. 115 miniature neat gas jets providing silent operation and ensuring that dust and fluff are not drawn into the burner.

The gas inlet is a ¼ in. B.S.P. female taper socket straight into the governor inlet, the form of which makes it almost impossible to fit a push-on rubber connexion. The inlet is intended for use with flexible couplings with screwed ends, in accordance with current B.S. requirements.

No Adjustment Needed

The Nocturne 505 requires no adjustment by a fitter, as the gas rate is fixed. The nominal gas rate is 6,000 B.Th.U. per hour. The rating is obtained by a governed supply, fixed restrictor and appropriately sized jets to suit the local gas.

Overall dimensions are, width 14½ in., height 10 in. and depth, back to front, 6½ in.—*Radiation Group Sales, Ltd., Radiation House, 7, Stratford Place, London, W.1.*

Vacuum Cleaner Display

The British Vacuum Cleaner and Engineering Co. Ltd. displayed a wide range of vacuum cleaners at the recent Royal College of Nursing Exhibition and Fair 'Horse to Helicopter,' with models dating from 1901. B.V.C. can rightly claim to be the pioneers of the vacuum cleaner industry and over the years have been in the forefront in introducing both domestic and industrial types. Today, all methods of transport including railways, buses, steamships and aircraft are cleaned by machines produced by this Company. Of special interest to visitors to the Exhibition were the early domestic models, first introduced in 1906. The range was completed by various present-day Goblin domestic cleaners throughout the world. —*British Vacuum Cleaner and Engineering Co., Ltd., Goblin Works, Leatherhead, Surrey.*

New Service Centre

Expanding sales in the North of England, coupled with the increasing number of industrial installations, have led Electronic Instruments, Ltd., to open a new service centre in Bradford at 8, Duke Street. This centre, under the personal direction of Mr. A. C. Stewart, has been equipped with instruments and spares to provide full repair facilities and to act as a showroom and demonstration centre for the firm's products.

The city of Bradford has been selected because of its situation, which gives excellent coverage for the main industrial areas in the north of England.

One of the Company's principal activities is concerned with the manufacture of industrial pH equipment. The complex nature of some of these installations and the high intrinsic value of the processes being controlled, has prompted the Company to introduce a fleet of pH mobile service units.

This pH service, which is claimed to be unique, ensures that every E.I.L. customer is regularly visited by a skilled engineer to ensure that the plant is working at its best efficiency. One of the mobile service vans is stationed at the new Bradford centre and tours the North and North Midland counties.—*Electronic Instruments, Ltd., Lower Mortlake Road, Richmond, Surrey.*

Expansion Joint Filler

A new expansion joint filler material for use in all forms of concrete construction is announced by the Expanded Rubber Co., Ltd. Named X.1004 expansion joint filler material, it couples excellent recovery properties after compression with protection against water absorption —a quality characteristic rarely found in more conventional filler materials.

The known performance of this filler material, fully established by an independent Air Ministry test house, derives from the unique construction of the material which is formed of innumerable closed cells. These closed cells make for lightness, ease of handling, and durability as well as rejection of the moisture rising from the sub-grade or from the other sources.

X.1004 is available in strips cut to pre-determined lengths or it can be easily cut on site as required. It is particularly applicable in concrete road, airfield runway construction and where temperature changes create distinctive expansion and contraction variations.—*Expanded Rubber Co., Ltd., Mitcham Road, Croydon, Surrey.*

New Coat of Paint

Those who were fortunate enough to be at the Oval for the final test, will have noticed the famous gasholder's smart new dress in two shades of green embellished with silver. The materials chosen for this 'new look' effect were Atlas Ruskilla gasholder paints.—*Atlas Preservative Co., Ltd., Fraser Road, Erith, Kent.*

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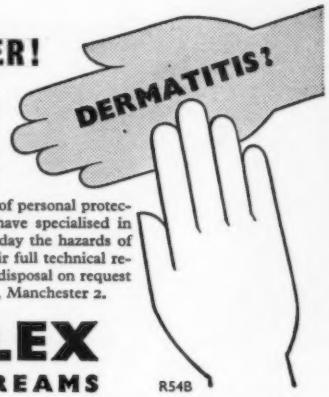

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Classified Advertisements: All small classified advertisements are charged at 2/6 per line (approx. 7 words)—minimum charge 10/-. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

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NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN & MIDLANDS REPRESENTATIVE: A. Engelhardt, T.D., 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Fleet Street 2236-7.

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(Director, B. T. King, A.I.M.E., Patent Agent) Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

APPOINTMENTS VACANT

WEST MIDLANDS GAS BOARD

WORCESTERSHIRE/HEREFORDSHIRE DIVISION
ENGINEERING DRAUGHTSMAN

APPLICATIONS are invited for the above post, which is located in the Divisional offices at Worcester.

Candidates must be experienced in general engineering draughtsmanship and should have knowledge of the design and construction of gasworks plant and buildings.

The salary will be in accordance with A.P.T. Grade 9 (£755-£855 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications stating age, qualifications, together with details of present and previous employment and names of two referees, should be addressed to Mr. C. F. W. Rendle, Divisional General Manager, West Midlands Gas Board, Newtown Road, Worcester, to reach him by September 10, 1956.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

BIRMINGHAM AND DISTRICT DIVISION
ENGINEERING ASSISTANTS

APPLICATIONS are invited for a FIRST ENGINEERING ASSISTANT, A.P.T. Grade 11 (£850-£975 per annum) and a SECOND ENGINEERING ASSISTANT, A.P.T. Grade 8 (£710-£790 per annum) of the National Salary Scales for Gas Staffs.

Candidates for both positions should be Associate Members of the Institution of Gas Engineers, or possess equivalent qualifications. Employment may be at any of the four Birmingham Gas Works, the productive capacities of which range from 21 to 53 mill. cu.ft. per day.

The duties of the First Engineering Assistant will entail supervision and technical control of Coal Gas or Water Gas production including some of the ancillary plant, with direct responsibility to the Assistant Engineer. Considerable experience in work of this nature is essential.

The duties of the Second Engineering Assistant entail general assistance in the supervision and technical control of the same plant; some previous experience is necessary.

Opportunities will be afforded in both cases to gain a wide experience of large scale gas production.

The posts are pensionable and the successful candidates may be required to pass medical examinations.

Applications stating age, experience, positions held and qualifications, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Gas Offices, Edmund Street, Birmingham, 3, to reach him not later than September 10, 1956.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION
WORKS SUPERINTENDENT—STOURBRIDGE

THE plant consists of Woodall-Duckham Vertical Retorts and Humphreys and Glasgow C.W.G. Plants.

The successful candidate will be responsible to the Station Engineer for the control of all technical staff and workpeople engaged on the Works, and for the operation and maintenance of Works plant and vehicles. Good organising ability and experience is essential.

Candidates should preferably possess the Institution of Gas Engineers Higher Grade Certificate in Gas Engineering (Manufacture) or an equivalent professional qualification.

The salary for the post will be in accordance with A.P.T. Grade 9 (£755-£855 per annum) of the National Salary Scales.

The post is pensionable and the successful candidates may be required to pass a medical examination.

A modern semi-detached house near the Works will be available at a reasonable rental.

Applications, giving details of age, qualifications and experience, together with the names of two referees, should be addressed to Mr. Stanley Jones, Divisional General Manager, West Midlands Gas Board, Kensington House, Bath Street, Dudley, to reach him by September 10, 1956.

J. C. INGRAM,
Secretary to the Board.

NORTH WESTERN GAS BOARD

CENTRAL LANCASHIRE GROUP
TECHNICAL ASSISTANT TO GROUP PRODUCTION ENGINEER

APPLICATIONS are invited for the above pensionable appointment at a salary within Grade A.P.T. 10 (£820/£920 per annum).

The duties will consist of investigating technical problems at production stations within the Group. Applicants should be capable of dealing with steam, electrical and mechanical problems and have a knowledge of chemistry. Preference will be given to applicants who have passed the examination of the Institution of Gas Engineers or possess an equivalent qualification. A house will be available if required.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B., Central Lancashire Group, Gas Offices, Stanley Buildings, Silver Street, Bury, within 14 days.

EASTERN GAS BOARD

NORWICH DIVISION
THETFORD DISTRICT

FIRST CLASS GAS FITTER required for the above Undertaking. Full J.I.C. rates (Provincial 'A') and conditions of service.

A house will be available on a service tenancy for a period of two years, or until the successful applicant can find accommodation within that period. The successful candidate will be required to pass a medical examination.

Applications, giving details of age, present duties and references, should be made to the undersigned within fourteen days of the appearance of this advertisement.

L. C. B. WILLIAMS,
Manager, King's Lynn Group.

Eastern Gas Board,
Wisbech Road,
King's Lynn,
Norfolk.

(*Classified advertisements continued on page* 518)

APPOINTMENTS VACANT (ctd.)

NORTHERN GAS BOARD

DARLINGTON DIVISION
SENIOR TECHNICAL ASSISTANT—
DARLINGTON UNIT

APPLICATIONS are invited for the position of SENIOR TECHNICAL ASSISTANT at the Darlington Unit.

Applicants should be qualified to undertake full responsibility, under the Works Manager, for supervision of the chemical staff, control of a G.W. Vertical Retort Installation, modern C.W.G. Plants and ancillary equipment. Corporate Membership of the Institution of Gas Engineers or equivalent qualification will be an advantage.

The salary will be within Grade APT. 9 Provincial 'A' (£755 to £855 per annum) of the National Salary Scales, initial placing according to experience and qualifications.

The successful applicant will be required to pass a Medical Examination and join the Board's Pension Scheme.

Applications, stating age, experience, qualifications and the names of two persons to whom reference can be made should be addressed to the undersigned not later than September 21, 1956.

F. WILSON,
Divisional General Manager.

Gas Offices,
John Street,
Darlington.

NATIONAL COAL BOARD

EAST MIDLANDS DIVISION
CARBONISATION DEPARTMENT

NATIONAL COAL BOARD, East Midlands Division, invite applications for the following posts at The Avenue Carbonisation and Chemical Plant.

S.V. 603.
MANAGER of the Tar and Benzole works.

S.V. 604.
ASSISTANT MANAGER of the Tar and Benzole Works.

The Tar works comprises a 200 ton continuous distillation unit with plant for producing high grade naphthalene, tar acids, pyridine and anthracene in addition to pitch, pitch creosote, etc.

The Benzole plant is of 18/20,000 gallons per day capacity designed for pure products.

S.V. 605.
MANAGER of Sulphuric Acid and Sulphate of Ammonia units, Effluent Treatment Plant and Gas Purifiers.

The Acid Plant is a 50 ton a day unit. Gas purification towers are 27 million cu.ft. per day, the effluent plant a Permutit-Woodall-Duckham Unit, the Sulphate Plant a standard indirect unit.

Applicants for the above posts should preferably have a recognised qualification, i.e., Hons. Science Degree or Corporate Membership of the Institute of Chemical Engineers or Institute of Chemistry. Good experience necessary.

The salary for both Manager Appointments will be in the range of £1,000 to £1,700, according to qualifications and experience. The salary for the Assistant Manager will be in the range of £825 to £1,250.

Applications giving full details of qualifications and experience with references should be addressed to:—

The Staff Director,
The National Coal Board,
East Midlands Division,
Sherwood Lodge,
Arnold,
Near Nottingham.

Please mark envelopes and applications with the appropriate S.V. Reference.

COALITE AND CHEMICAL PRODUCTS LTD. invite applications for the position of SHIFT SUPERVISOR at their large Carbonising and By-Product Plant at Bolsover. A Superannuation Scheme is in operation, and the successful candidate will have a concessionary Fuel allowance.

Applicants, who should preferably have had experience on Carbonising and By-Product Plants, please write in first instance giving details of age, experience and salary required to:—Coalite and Chemical Products Ltd., Post Office Box No. 21, Chesterfield, Derbyshire.

SOUTHERN GAS BOARD

OXFORD AND DISTRICT GROUP
DISTRICT FOREMAN

APPLICATIONS are invited for the position of DISTRICT FOREMAN at Oxford.

Candidates must have a sound knowledge of modern domestic and commercial gas appliances and their installation, and possess at least the Final Grade Gas Fitting Certificate of the City and Guilds of London Institute.

The salary will be in accordance with Grade 5 (Provincial 'A') of the Salary Scales of the National Joint Council for Gas Staffs, £575-£655 per annum. A flat may be made available at a reasonable rent.

The successful candidate will be required to undergo a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations 1950, will be required to join the Board's Staff Pension Scheme.

Applications stating age, qualifications, details of training and of experience, together with the names of two referees, should be addressed to reach the undersigned by September 15, 1956.

S. C. BENTLEY,
Engineer and General Manager.

Southern Gas Board,
Oxford and District Group,
P.O. Box No. 3,
Therm House, St. Aldates,
Oxford.

August 27, 1956.

EAST MIDLANDS GAS BOARD

LEICESTER AND NORTHANTS DIVISION
DISTRIBUTION ENGINEER—WELLINGBOROUGH GROUP

APPLICATIONS are invited for the post of DISTRIBUTION ENGINEER, Wellingborough Group. The appointment will be made within Grades APT. 11/12 (salary range £850/£1,025), and the salary at commencement will be dependent upon the qualifications and experience of the person appointed.

Applicants, who should possess the Higher Grade Certificate in Gas Engineering (Supply) of the Institution of Gas Engineers, or its equivalent, must have had considerable experience in a modern Gas Distribution Department and should be competent to supervise systems involving the use of low, medium and high pressure mains with district holders.

The Distribution Engineer, who will be required to reside in or near Wellingborough, will have overall responsibility for the distribution function within the Group, which comprises the Wellingborough, Rushden and Kettering/Corby districts with approximately 45,000 consumers. He will also be responsible for Holder Stations and general property repairs and maintenance in the Group.

The post is pensionable, and the successful applicant will be required to pass a medical examination. Applicants stating age and giving details of education, qualifications and experience, together with the names of two referees, should be addressed to reach the undersigned not later than September 8, 1956.

H. B. TAYLOR,
Gas Offices, Divisional General Manager.
Millstone Lane,
Leicester.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION
DIVISIONAL DISTRIBUTION TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of DISTRIBUTION TECHNICAL ASSISTANT at the Divisional Headquarters, Lincoln.

Applicants should have had some practical experience in mains and service work generally and have considerable knowledge of the design of distribution systems, together with experience in the estimation of materials and costs. Preference will be given to a candidate possessing a recognised technical qualification.

The appointment will be made within grades APT 5/6/7 (£575/£750 p.a.) of the National Salary Scale for Gas Staffs, the commencing salary will be in accordance with the age, qualifications and experience of the successful candidate.

A Board's house will be available under the terms of a service occupation agreement and at a reasonable rent, if required.

The post is pensionable, and the person appointed will be required to pass a medical examination.

Application giving full details of age, education, qualifications and experience together with the names of two referees should be addressed to reach the undersigned not later than September 15, 1956.

BERNARD CLARKE,
Divisional General Manager.

Belle Vue House,
Carline Road,
Lincoln.

August 23, 1956.

APPOINTMENT OF CHIEF DRAUGHTSMAN

NORTH WEST GAS & CHEMICAL ENGINEERS require the services of a CHIEF DRAUGHTSMAN age about 35 years.

The appointment is an important one and will carry appropriate remuneration.

Applicants must have had experience in the gas industry and a knowledge of associated chemical plant and will be required to take charge of staff dealing with design, estimating and detail work. Membership of recognised technical institutes would be advantageous.

This is a pensionable position and the successful candidate would have the opportunity of further advancement.

Assistance will, if required, be given towards finding suitable accommodation.

Apply stating age, full particulars of experience and present salary to No. 291 *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

PLANT FOR SALE

FOR SALE.—Ex Stock—Electrostatic Precipitator by Simon-Carves Ferranti to 40,000 volts—375 Milliamps D.C. Unused or very little used. Can be viewed in Manchester—£1,250. Address: No. 290 *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

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SPECIAL OFFER:

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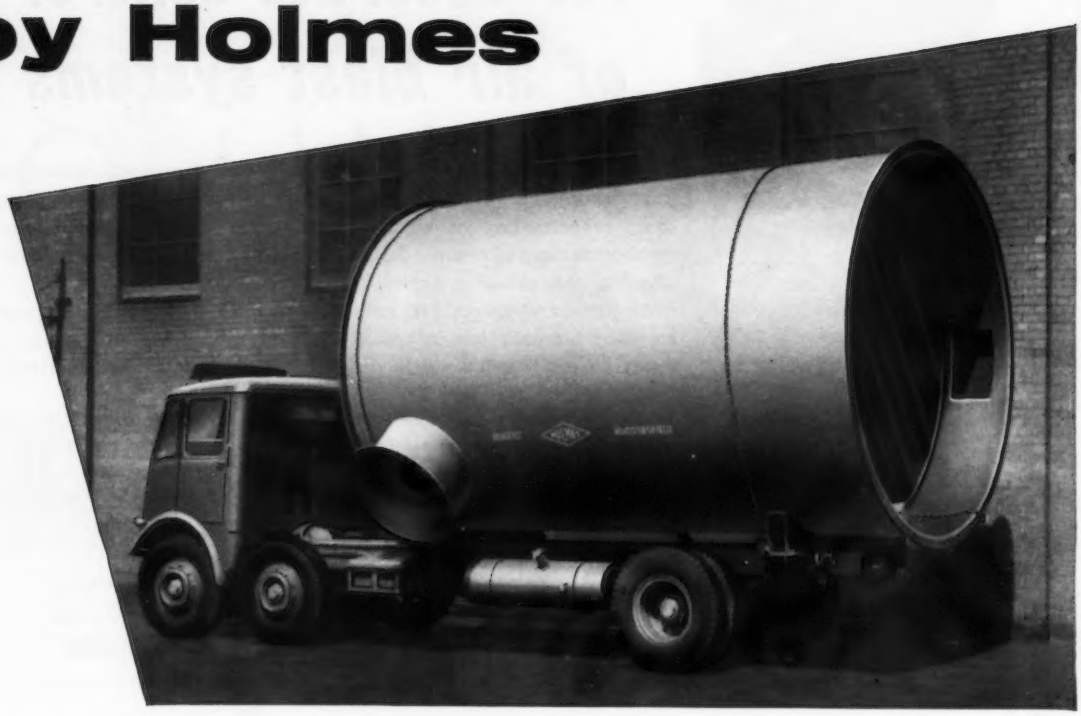

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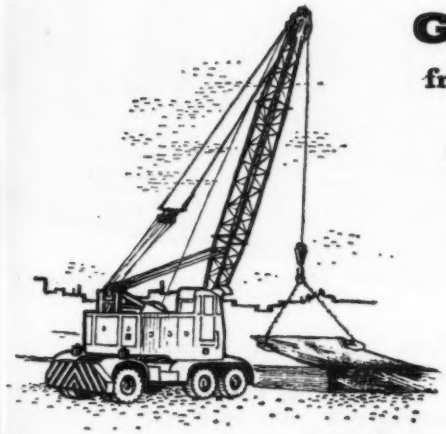

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Air pressures between ¼ lb. and 1 lb. are used normally but in special instances up to 2 lb. can be used.

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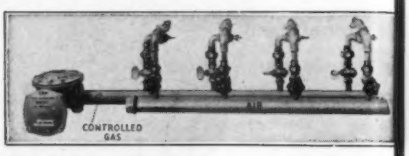
The Type 3 zero governor is a modification of the controller. Providing individual control of burners, it gives greater effective control of heat distribution, facilitates burner ignition and has greater sensitivity and range than previous types.



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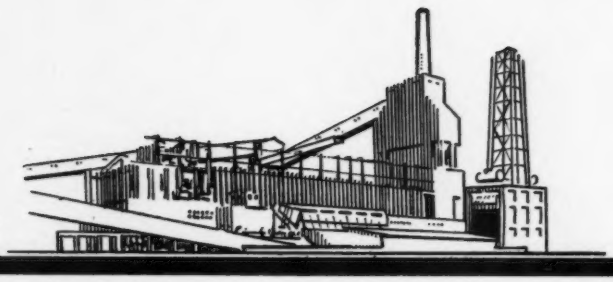
COLLIN coke ovens



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